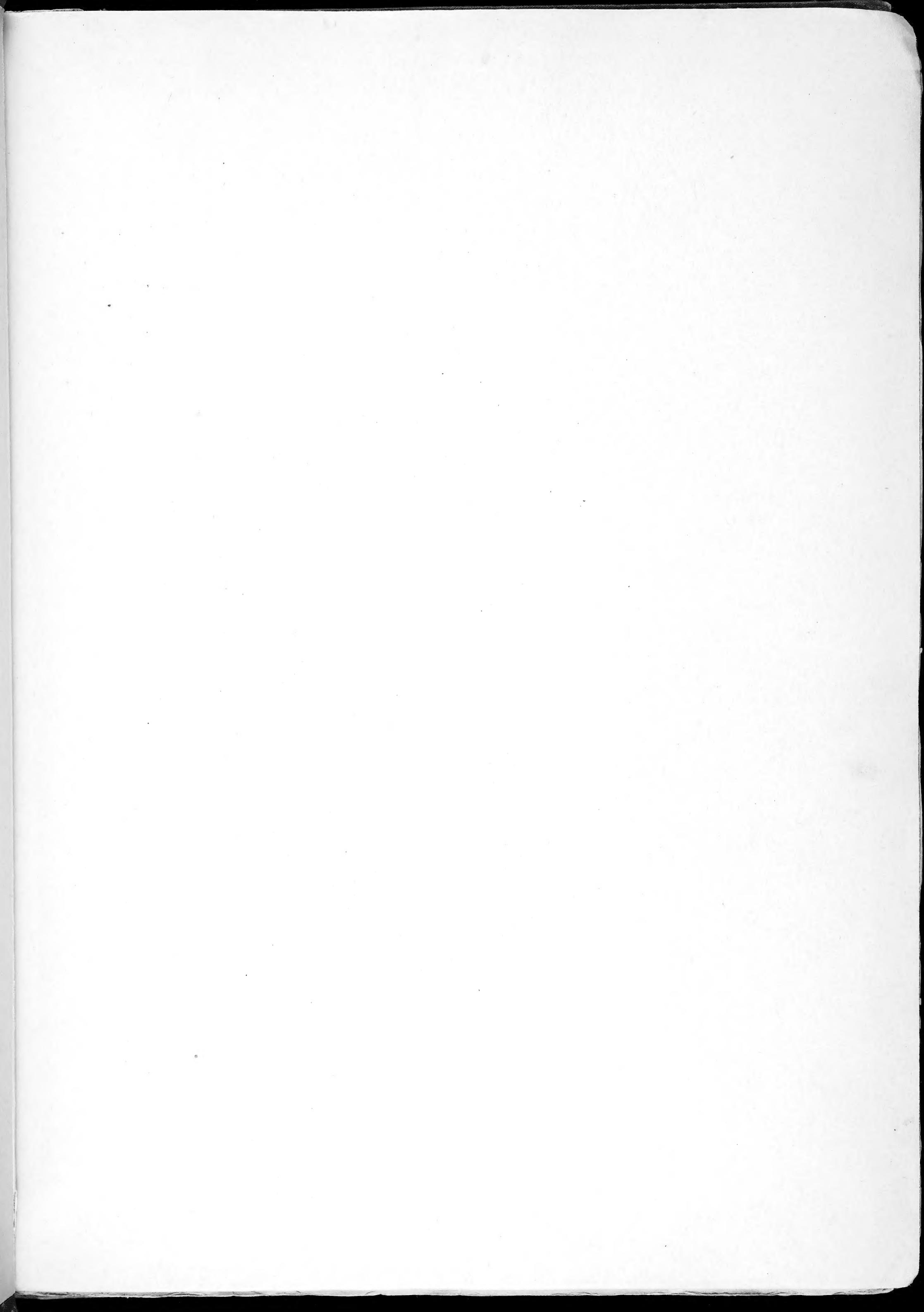
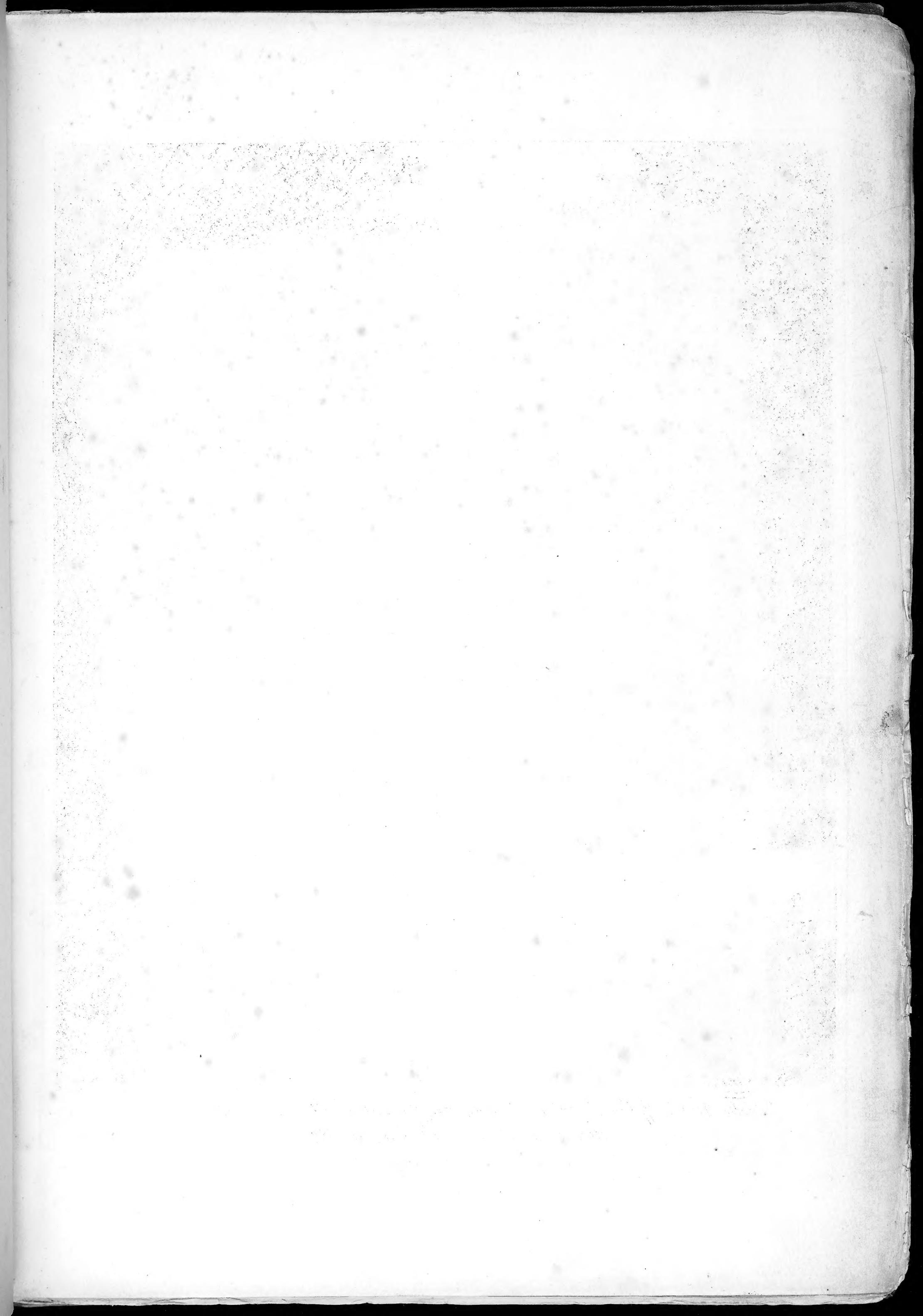


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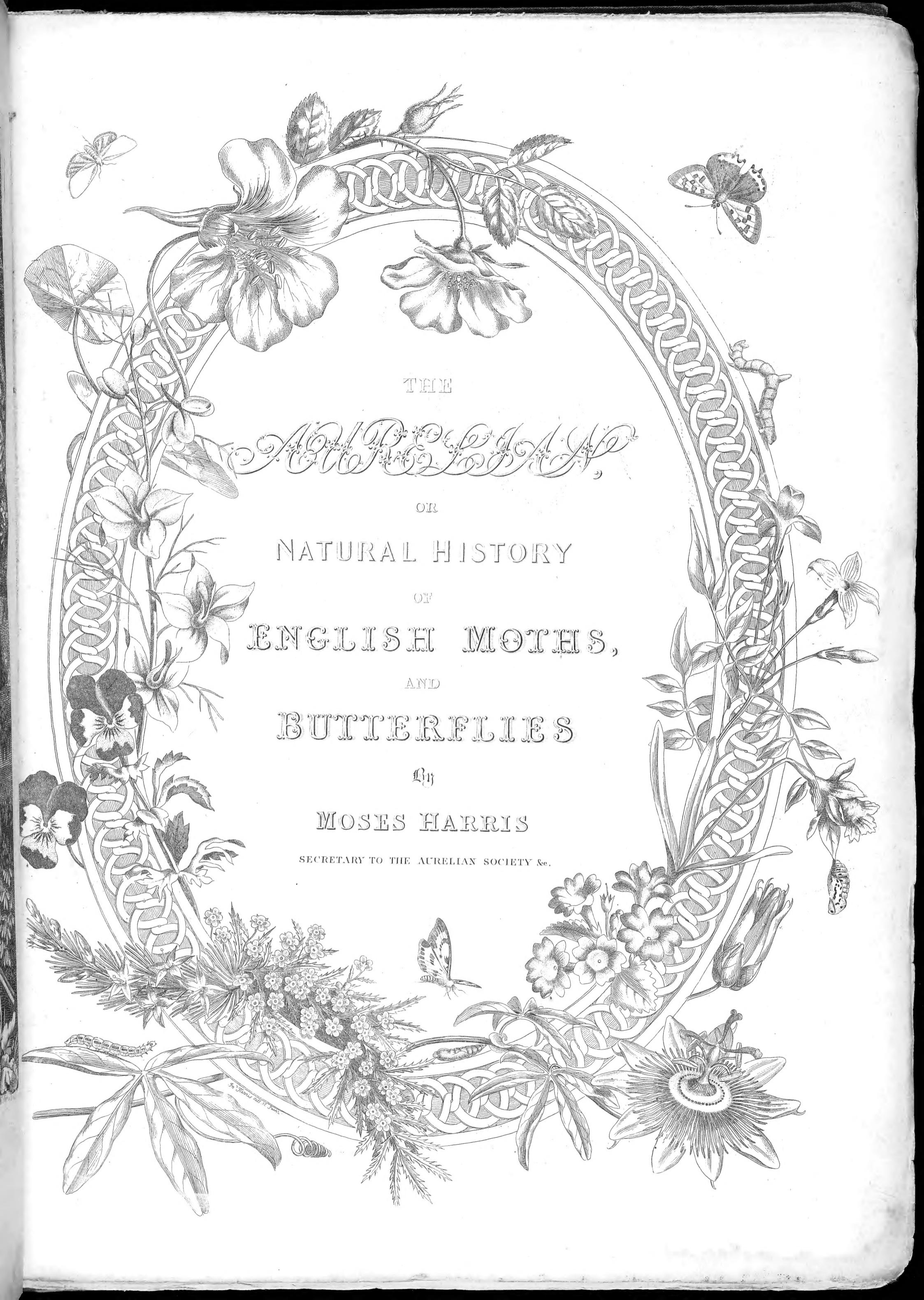








O the Works of the Lord are Great, & sought out of all  
that have pleasure therein. Ps. CXL. v. 2.



THE  
*AURELIAN*,  
OR  
NATURAL HISTORY  
OF  
ENGLISH MOTHS,  
AND  
BUTTERFLIES  
By  
MOSES HARRIS

SECRETARY TO THE AURELIAN SOCIETY &c.



THE  
**AURELIAN**  
A  
**NATURAL HISTORY**  
OF  
**ENGLISH MOTHES AND BUTTERFLIES,**

TOGETHER WITH THE  
FIGURES OF THEIR TRANSFORMATIONS

AND OF THE  
PLANTS ON WHICH THEY FEED.

*DRAWN, ENGRAVED, AND COLOURED FROM THE NATURAL OBJECTS.*

BY MOSES HARRIS,

SECRETARY TO THE AURELIAN SOCIETY.

NEW EDITION,

WITH THEIR SYSTEMATIC NAMES, SYNONYMS, AND ADDITIONAL OBSERVATIONS UPON THE HABITS OF THE  
SPECIES FIGURED.

BY JOHN O. WESTWOOD, F.L.S.

HON. MEM. SOC. NAT. HIST. QUEBEC, MOSCOW, LUND, LILLE, MAURITIUS, SOC. ENT. AND CUVIER. PARIS,  
ETC. ETC.

LONDON:  
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## PREFACE TO THE PRESENT EDITION.

A NEW edition of "The Aurelian" having been called for, it has been considered that it would be most advantageous to those engaged in the investigation of the beautiful tribes so beautifully illustrated by Harris, that the descriptions given originally by the Author should be accompanied by the modern scientific names of the insects figured, their synonyms, references, &c. as well as by additional observations upon their manners and transformations.

These additions are printed in different types from the original text, which it has been thought advisable to preserve, with no other variation than the orthography.

It would be useless at the present day to say any thing in praise of a work, which has been so long and so favourably known to the entomological world, as "the Aurelian." That Harris took the idea from L'Admiral's work is certainly true, and that one or two figures of very rare insects are copied therefrom is admitted by Harris himself, but the grace with which he delineated the difficult and varied positions of insects whilst on the wing, the elegant arrangement of many of his plates, and above all the correctness of his figures, are a sufficient answer to the charge of plagiarism which has been brought against him.

The greatest care has been taken in order to render this edition worthy of the patronage of the public, especially in the colouring of the plates, the original drawings of the work, now in the Library of William Knight, Esq. of Islington, having been kindly lent for that purpose.

J. O. W.

Hammersmith, June, 1840.



## INTRODUCTION.

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THE following work is the production of many years severe study and application ; though it must be owned that the pursuit of it has afforded the Author many pleasing and delightful excursions, in procuring objects in this favourite branch of Natural History.

“Whether he steals along the lonely dale  
In silent search, or climbs the mountain  
Rock, fir'd by the nodding plumage of its brow,  
Or muses through the woods at noon—  
— ever delightful in the ceaseless hum ;—  
Full nature swarms with life ; one wond'rous mass  
Of animals, or atoms organized ;  
Waiting the vital breath, when Parent Heaven  
Shall bid his Spirit blow.”

Anybody the least acquainted with Natural History need not be informed that all insects, from the largest to the smallest, are originally produced from eggs, from which the maggots or caterpillars come forth : after feeding till they arrive at their full growth, they change into the chrysalis or aurelia state, where they lie inactive some time, till at length they come out in their perfect fly state, either moth, butterfly, beetle, &c. when they propagate their species and die. But it must be observed, that all caterpillars that have not less than ten nor more than sixteen legs, only produce moths or butterflies ; those that have more, produce what have hitherto been distinguished by the name of Ichneumons [Tenthredinidæ] ; and such as have less, commonly produce the Beetle or Chafer kind.

The females, both of moths and butterflies, lay their eggs in a few hours after copulation, upon or contiguous to what is designed to be the food for the young caterpillars when they appear from the shells : some produce the caterpillars in fourteen days, others in four or five weeks, some again do not appear till the expiration of four or five months. When the young caterpillars are perfect within the shells, they eat, or rather crumble the shell away with their jaws, and feed on what was provided by the parent for them ; these caterpillars having grown to their full size, and purged themselves from their excrement, cast off their last skin, and become a chrysalis or an aurelia ; from which, after lying in that state a certain number of days, weeks, or months, according to the respective species or class to which they belong, a fly or moth is produced, in the likeness of its parent ; and this is their general progression.

In the following account of their respective changes and appearances, I shall endeavour to prepare the young AURELIAN for the perusal of the following work ; where each insect, whose history is known, is particularly considered, and represented in its different states.

*Of the Eggs, and manner of laying them.*

Moths and butterflies deposit their eggs in remarkably different manners ; some fasten them to the food by a viscous moisture, detached from each other, at small but irregular distances : others lay them in a confused heap, fastened together like a lump of sand : some range them in regular order, like a curious pavement of round pebbles ; these are on a plain or flat surface : but others lay them round a stalk or blade of grass ; some cover them with a woolly or downy substance, which keeps them from the cold and hides them from the sight of birds : others drop them, as they fly, loose on the ground, in a promiscuous manner ; of these, most of the caterpillars feed on the grass.

*Of the Caterpillar, and its change to the Chrysalis.*

In their progress from the egg to the chrysalis they shift or throw off several skins, generally one every seven days ; but I am not certain whether they all shift the same number of skins : those which I have noticed have cast their skins five times, and it is supposed they all do the same : however, they are about seven weeks in their caterpillar state, at the expiration of which time they are full fed, and prepare for a future state by making themselves a secure retreat, wherein they lie two or three days, during which time they shrink and grow shorter, losing the use of their feet entirely, and appear as if in great agony ; at length the skin on the first two joints behind the head, which at this time appear very much swelled, bursts, or rather splits, and opens some way down the back and across the head, so that in some you would at first sight suppose the head of itself was divided. During this time the caterpillar strives to throw off its skin, which however it facilitates by a motion very peculiar, working off the skin joint by joint till it arrives quite to the tail ; nor does it cease twisting and turning itself till quite disengaged from it : it is very soft and tender, and it is generally a day before the shell of the chrysalis becomes hard ; during which time of hardening it very frequently turns itself, that the side on which it lies may not be flatulated or deformed : yet when the shell becomes hard it lies motionless, unless disturbed by some accident, till the expiration of a certain time, and at length breaks forth into the winged state : but during the time of its being in the chrysalis state it receiveth no nourishment of any kind, although some remain in that state near two years.

*From the Chrysalis to the Fly.*

When the fly is perfectly formed within the chrysalis, or more properly when each part has arrived at its proper shape, strength, and texture, the chrysalis then appears much darker ; and if that of a butterfly, the markings of the wings are plainly seen through the transparent chrysalis. At this time the hull or shell of the chrysalis is separated from the fly, whose every part begins to grow drier, whereby it is better enabled to separate them : thus being as it were unbound and capable of moving, it makes a strong effort at once with that part which I shall call its shoulders, and pushing at the same time with its legs forward, it splits the head-part of the shell in

three divisions ; one in the front, which covers its legs and face, the other two one on each side, covering the wings ; it then bends itself forward, and the front division or mask yielding, it lays hold on the lower or jointed part of the shell, and draws itself entirely out : being disengaged from the chrysalis, its next business is to reach a place where it can hang by its legs with its wings downward, and where they may stretch and grow without obstruction. For the wings of the largest flies, when they first come out of the chrysalis, are not much bigger than a silver penny. It seems very careful in the management of its wings while they are growing ; often shaking its body, lest by their dampness they should stick together ; then by a gentle rocking of its body trying if it can feel with its wings any thing that may obstruct their growing ; and if so, it will directly creep higher, or move to a greater distance. As the wings grow they rumple and pucker in rude fashion ; but after a short time they nicely expand themselves, hanging very flat, and exactly even with each other. They now appear of the consistence of paper which is rotten damp ; but they are much less time in drying than in growing to the full size. When one of these insects thinks its wings ready it suddenly opens them a little way, and if it finds them too heavy, or that they yield, bend, or give way in striking the air, it very cautiously closes them again : at length it begins to open and shut them softly, as it were fanning them lightly, till they are quite dry, then suddenly starts into the air and flies away.

A butterfly is ready for flight in less than half an hour after it comes from the chrysalis, and the largest moths hardly exceed an hour.

The food of both moths and butterflies is much alike, being chiefly the honey which they extract with their long proboscis out of flowers, or the honey-dew, which is found on the leaves of trees, plants, &c. Indeed it may be excepted, that some moths do not feed, nor take any sustenance whatever, the females in particular ; nor have some any visible organs for such purpose.

How many different species of moths and butterflies we have now in England, it is certainly impossible even to form a judgment of. However, of those already known our catalogue amounts to between four and five hundred : of flies we have about fifty ; neither is there much expectation of any more ever being discovered.\* But of moths something new may be found almost every day, if sought after with diligence.

*The distinguishing Character between a Moth and a Butterfly, considered in their caterpillar, chrysalis, and winged states.*

First, then, to begin with the winged state. The horns or antennæ of a butterfly have a knob or ball at the extremity or end of each ; and are for the most part nearly straight. The antennæ of moths chiefly diminish gradually, and end in a sharp point ; though indeed some swell about the middle, or towards the point or end ; some are comb-like, and very broad, others appear like fine thread ; and most of

\* Since the time of Harris great additions have been made to the lists of British Lepidopterous insects, the entire number of which is now ascertained to be at least two thousand. Of these, about eighty are well ascertained species of Butterflies, in addition to which about fifteen others have been introduced, but upon doubtful authority. Even within the last twelve months two additional species of Butterflies have been introduced into our Catalogues. J. O. W.

them have a winding motion, from the root to the extremity; others are notched on the under or inner side, like the teeth of a saw.

The tails or abdomens of butterflies commonly lie in a kind of groove or bed, which is formed by the under-wings; neither do the tails reach below the edge of the under-wings. The tails of moths in general lie beneath the under-wings, and reach to the extremity of them, and in many considerably beyond.

A butterfly always sleeps or rests with its wings erect over its back; the under-wings being broad, and without folds. A moth commonly rests with its wings covering its tail and under-wings; on which account Providence has ordered it so that the under-wings of all moths fold themselves up half way in the manner of a fan.

A butterfly always flies in the day, and mostly in the morning, but never in the night. Some moths fly in the day-time, some after sun-set in the evening, and others in the dead of the night.

Though these are rules very sufficient whereby you may know a moth from a butterfly, yet there are many exceptions to them: and although moths and butterflies are two different genera of insects, yet I really believe it is impossible, by any proposed particularity, to fix a rule to know the one by, which some single part of the other will not be an objection to. The same difficulties arise, in attempting to class either the moths or butterflies, though several have endeavoured to do it.

When a moth, in any part of its investiture, seems to agree with a butterfly, viz. either in the horns, shape of the wings, &c. it will differ in every other particular, and that so notoriously, that you may always be able to know which of the two it is. Thus the great Magpie Moth, in the form of its wings much resembles a butterfly;\* but its horns or antennæ are like crooked threads; the head remarkably small; its abdomen reaches to the bottom edge of the under-wings, which have several folds in them; and although all this class of moths do most resemble a butterfly at first sight, yet the caterpillars from whence they proceed, have the least resemblance to those of the butterfly kind. It is often to be observed, that those broad-winged moths mostly proceed from Loopers, which have the smallest number of legs, while those of the butterfly kind have the most; and indeed, I know not any other matter, either texture of wings, manner of flight, food, or any thing else, in which it in any way resembles the butterfly kind.

Mr. Wilkes, in his new Class of Moths, book ii. chap. i. mentions flies resembling partly moths, and partly butterflies. Here he produces but two, which to me are no proofs of any such strange beings; nor would I have taken the liberty to have mentioned it in this work, but to oppose a system which admitted of such an order, by the novelty of the thought, and which, perhaps, in process of time, would have added a great number of other moths and butterflies into a genus of insects, never before heard of, at least in this part of the world. The moths he speaks of, are the Burnet and Forester, the horns or antennæ of which swell pretty much towards the point or extremity: but this is not at all like the ball or knob at the end of the

\* The Swallow-tailed Moth (*Ourapteryx Sambucaria*) still more strikingly resembles the Swallow-tailed Butterfly (*Papilio Machaon*) in possessing tailed hind wings: this kind of relation, founded upon a single character, so well described in the text, has been distinguished by modern Naturalists (MacLeay, Swainson, &c.) under the name of Analogy, as distinct from the more intimate relation which exists amongst moths or amongst butterflies, which they term Affinity. J. O. W.

butterflies' antennæ; in their setting position, their wings are remarkably closed about their bodies, which appear much below the under-wings: but indeed these insects, in every circumstance, less resemble the butterfly than any genus of the moth kind that I know, either in the form or in the colour, which latter is in these so very remarkable, that none of our butterflies have the like; I mean that fine shining metallic green which covers their body and upper wings; for where greens are introduced in the butterfly kind, I mean only those of this island, you will always find it on the underside, and not a green of this shining quality.

*Their Caterpillars likewise differ in the following particulars.*

Those of the butterfly kind have all in general, that are yet known, sixteen legs, and those placed in the manner following: supposing that caterpillars of all kinds have twelve joints, rings, or divisions behind the head, the segments to which the caterpillar's legs are attached are marked by cyphers, counting from the head to the tail.

1	2	3	4	5	6	7	8	9	10	11	12	segments.
0	0	0				0	0	0	0			0 $\}$ legs.
0	0	0				0	0	0	0			0 $\}$

The first six toward the head are in the form of hooks or claws; the eight which are in the middle, may with more propriety be called legs, being formed of the same fleshy substance as the body, and being most employed when the animal is in motion; the two last may be called holders, because with them they hold or adhere very strongly to the leaves and branches, nor do they ever loose them when creeping, till all the rest of the feet are fixed.

The caterpillars of the moth kind differing greatly with regard to the number of legs, I shall divide them into five different classes, viz. loopers, half loopers, quarter loopers, those having no holders behind, and the common sort, which have the same number with those of the butterflies; the legs of the loopers are placed thus:

1	2	3	4	5	6	7	8	9	10	11	12	segments.
0	0	0					0					0 $\}$ legs.
0	0	0					0					0 $\}$

These loopers move forward by stretching or extending themselves at full length, holding fast at the same time with their hind holders, and the next which are placed on the 9th segment; they then fix fast their six claws nearest the head, and loosing their holders, draw their tail-part quite close to their fore-part, so that at every step or stride they form a loop, and are for that reason called loopers. The legs of the second class are placed thus,

1	2	3	4	5	6	7	8	9	10	11	12	segments.
0	0	0					0	0				0 $\}$ legs.
0	0	0					0	0				0 $\}$

and are called half loopers; because in walking or creeping, they bend their bodies in the form of a half loop; or to speak more intelligibly, the legs of the 12th segment are never drawn up close to the legs of the front part of the body, which is the case with the loopers.

The third class have fourteen legs, which are placed as beneath, and are for

distinction sake called quarter loopers, and with the same propriety as the last are called half loopers; for they bend their bodies in the form of part of a loop, though not so much as the half loopers do. The legs of this sort are thus placed :

1	2	3	4	5	6	7	8	9	10	11	12	segments.
0	0	0				0	0	0			0	legs.
0	0	0				0	0	0			0	

The fourth class have likewise fourteen legs, though placed in a different manner, they having no hind holders.

1	2	3	4	5	6	7	8	9	10	11	12	segments.
0	0	0				0	0	0	0		0	legs.
0	0	0				0	0	0	0		0	

The legs of the fifth class are the same with the butterflies, both in situation and in number, which is sixteen, nor has any Lepidopterous caterpillar more.

The caterpillars producing butterflies are rarely observed to be hairy, some being quite naked, others covered with a short woolly down, something like that upon the peach, the rest are beset with branched spikes, which those of the moth kind never (or but rarely) have; those caterpillars of the fly kind, which may be said to be hairy, have the hair very fine and tender: of those of the moths, some are thickly covered with long hairs, others have very few but those long; some have tufts or tussocks of hair on their back, the rest are quite naked.

The caterpillars of some of the butterfly kind, when ready for their transformation, hang themselves up by the tail, with their head perpendicularly downward, which are those of the thorny or spiked kind, and another class, of which we have but one species, viz. the Purple Emperor; with this difference between the two, that the one always chooses the under part of an horizontal plane, such as the ceiling of a room, to hang from; the other a perpendicular, such as a wall, &c.; the others fix themselves by the tail, with their heads perpendicularly upward, a silken string going round the middle to support them. It may be observed, that should the caterpillars of the branched kind fasten themselves to change, with a thread round the middle, like the smooth class, they could never get their skin off them, being interrupted by the silk thread; therefore nature, to avoid that inconvenience, directs them to hang themselves perpendicularly by the tail, that they may be free from every thing which might obstruct them in their time of transformation.

But perhaps nothing in nature more deserves our consideration and inspection, than the various methods which those of the moth kind take to hide and secure themselves from danger, while in that helpless and inactive state; some bury and change in the earth about one finger deep, within a tender web; others form a strong case in the earth, wherein they change to the chrysalis; some spin a case of silk very strong, most of which are nearly in the form of an egg; of this sort there is great variety, differing in form, texture, and colour,—some are long, and small at each end; others are flat at the ends; some very soft; others so hard as not easily to be cut with a knife; some change in cases within the bodies of trees; others folded and spun up in weeds, which float about in ponds on the surface of the water; some in stalks of plants without any spinning, except that which covers the hole, which they make for

their passage out ; some spin up in a fine transparent web like gauze ; others again are composed of so few threads as scarcely to contain the chrysalis : the caterpillars of the hairy sort generally mix their hair with their webs.

The chrysalides of many of the butterfly kind appear all over beautifully gilt, like burnished gold ; others variously spotted, like gold and silver ; some white, spotted with black ; others green striped and spotted with brown : most of these differ both in form and colour.

Those of the moth kind, especially of the larger sort, are of a dirty brown, and not greatly differing in form ; those indeed of the smaller kind vary in form and colour ; but there are none that may be reckoned extraordinary either for beauty of colour or shape, nor has any one of them the least appearance of metal on them, as those of the butterfly kind,—that being peculiar to them alone, and of them to one particular class, namely, those of the spiked or branched kind.

The eggs both of moths and butterflies vary so much, that I could not, without many exceptions, make any distinction between one and the other.

It is observable that butterflies never pass through the winter in the egg state ; and on the other hand, moths very rarely pass that season in their fly state : an observation that, I believe, has hitherto escaped general notice.

*Of the several sorts of Nets, and the manner of catching Flies.*

There are several sorts of nets made use of to catch insects, to wit, the batfolder, the racket, and the scissors net : the batfolder is made of mosquito gauze, and is formed like the batfolding net made use of to catch birds ; these may be had at the fishing-tackle shops by asking for them ; they call them butterfly traps.

The method of using the batfolding net is thus : on seeing the insect come flying toward you, you must endeavour to meet it, or lay yourself in its way, so that it may come rather to the right side of you, as if you intended to let it pass ; then, having the net in your hands, incline it down to your right side, turning yourself a little about to the right, ready for the stroke ; not unlike the attitude in which a batman in the game at cricket stands, when he is ready to strike the ball,—only his bat is lifted up, but your nets must incline rather downward : when the fly is within your reach, strike at it forcibly, receiving the fly in the middle of your net, as it were, between the two sockets of the benders, that being the part of the net which best receives the insect ; and not only so, but should the fly strike against the belly or wider part of the net, the course of air caused by the motion of the net, would carry the fly with it out of the net between your hands, which I have often experienced. The motion of your hands in catching, must be from your right hip to your left shoulder, not at all retarding the motion, till it is as it were spent, closing the net in the motion.

You are likewise to remember never to give the stroke over-handed, unless the situation of the place oblige you to it. Having closed the net with the insect in it, immediately grasp both the sticks in your left hand, and with your right lay hold of the bottom part of your net, pulling the gauze pretty tight, giving that also to the

gripe of the left hand ; this confines your fly from struggling. Put then your hand against the fly on one side, and bringing the top of your fore-finger on his body, and with your thumb on the other, squeeze him gently ; then lay your nets on the ground and take out your fly by an antenna or a leg, and holding him in an advantageous manner by the body in your left hand, run a pin through the thick part of the body or chest, perpendicularly, and put it in your box.

When you pursue a fly, you must catch it when in your reach, in the same manner, except its course is along a ditch, on the left-hand side of you, and then you will not be able to touch it, the position being very awkward ; in this case you must overtake it, and turning nimbly about, the position will then be as in the first case ; the fly then being to the right side of you. Having given you sufficient instructions for the use of the batfolder, I shall next proceed to the racket nets—

Which are formed of wire, about the thickness of a raven's quill, turned round to a circle, bending the ends outwards by way of shanks, which are made fast in a brass socket ; this circle or ring of wire is covered with gauze, and bound round with ferret ; a round stick of about two feet in length is fitted to this socket, by way of handle. This sort of net is what an AURELIAN should at all times carry about with him ; a pair of these, of about six inches diameter, is the most convenient for that purpose. The chief use of these nets is for catching moths sitting against a tree, wall, or pales ; or a moth or fly sitting on a leaf, may be conveniently caught between a pair of these.

The scissors net are no more than a small pair of these racket nets, fixed on two pieces of iron, which are riveted across each other, with two of the ends turned round in the form of rings, for the admittance of the thumb and finger ; in short, a pair of toupee irons, or curling tongs, such as is used by a hair-dresser, are very well adapted for this purpose, with a round net fixed to the end of each tang with binding wire, or small twine well waxed ; these nets are principally adapted to take small moths, &c.

I shall in the next and last place proceed to inform the reader what apparatus is necessary when he goes out to the field in pursuit of insects, and the method by which they are extended, or set, and preserved when brought home, and that he may not be inconveniently loaded with more things than are necessary : he should consider his principal pursuit before he sets out ; if his intention is to spend a summer's morning in some delightful woods where he may expect to find plenty of flies, he need take no other net with him than the batfolding net, one of the sticks of which may be used as a walking-stick, and the other may be made to divide into halves, or put together at pleasure by a brass socket in the middle, and carried conveniently with the benders in a canvas bag under his coat ; it will be proper to take two large chip or Dutch boxes, cut down pretty flat, and lined withinside top and bottom with cork, of about a quarter of an inch or somewhat less in thickness, which should be pasted over with white paper ; besides those he should be provided with another smaller box for caterpillars, in case such should fall in his way ; in the lid of which should be cut a hole, as large as will admit your thumb to go in easily ; this must be stopt with a cork, close fitted, so that small caterpillars may not get out ; together with these he must take with him a pincushion, well supplied with pins of different sizes, for the different sizes of insects which may be taken ; and be careful not to stick a small fly or moth with too large a pin, which will certainly destroy it by putting the joints of the wings

out of place, for such insects as are disjointed will never set well, and fall to pieces in a short time. And whereas some of the smaller flies or moths, by having so small a quantity of humidity, are very apt to dry in the box soon after being stuck with a pin, the Aurelian should take with him a quantity of such card braces as are described on the setting-board in the twentieth plate, and expand or set their wings before he goes out of the field, or rather as soon as he perceives them to be dead, otherwise it is impossible to do it afterwards.

It may not be improper to mention some other conveniences, which I have often found very necessary, such as a pretty large clasp knife, and some needles and thread. The first he will find useful on many occasions, and the second is necessary in mending the nets, in case he should tear them, and to repair other disasters, which are incident to people who frequent places where such sharp things as thorns and briars grow.

Having returned home with your insects, look in your boxes and observe which of them is fit to set, such as are dead, but not stiff, are so; then proceed to manage with them as follow:—Take a fly, and observing if the pin be perpendicularly run through the body, place it on the setting board, then with your point gently raise one of the upper wings, till such time as the tip be even with the nose of the fly; this done, fix one of your card braces on that wing, to prevent its giving way; do the same by the wings on the other side, and your fly will be properly extended: let the braces remain on the wings of butterflies a fortnight, on those of large moths a month.

The setting-boards, of which it is proper to have three or four, should be veneered over with cork, near a quarter of an inch in thickness, and covered over with white paper, smoothly pasted and fixed on with gum Arabic. The point which is made use of to set the flies, is nothing more than a common large needle, fixed in a kind of handle.

Although many and various have been the methods tried to preserve the flies in cabinets, from small insects which destroy them, by eating away their bodies, yet all attempts have been hitherto fruitless; I therefore think it necessary in this place to mention a method, which I think will effectually do the business, which is, to admit the smoke of tobacco into the drawer, by a hole made in the back part for that purpose; or small pieces of camphor might perhaps be less offensive.

## A TABLE OF THE TERMS

USED IN THE DESCRIPTIONS FOR THE VARIOUS PARTS OF THE PAPILIO; WITH REFERENCES TO THE ACCOMPANYING PLATE, WHEREIN THEY ARE DELINEATED AT LARGE.

- a* HEAD.
- b* Eyes.
- c* Palpi.
- d* Knobs of the Antennæ.
- e* Threads of the Antennæ.
- f* Spiral Tongue or Maxillæ.
- g* Thorax.
- h* Shoulders.
- i* Scutellum or Escutcheon.
- k* Abdomen with its Annuli.
- l* Tips or Apices of the fore wings
- m* Sector Edge.
- n* Fringes or ciliæ.
- o* Sector.
- p* Abdominal Groove of the hind wings
- q* Tails.
- r* Abdominal Corners.
- s* Lower Corners of the fore Wings.
- t* Outer Corners of the hind ditto
- u* Abdominal Edges.
- w* Anus.
- x* Ocelli or eye-like spots
- y* Bar, Band, or Garter.
  
- A** Superior Wing angulated.
- B** Superior Wing, smooth or even edged.
- C** Inferior Wing scalloped.
- D** Inferior Wing indenticulated.

### *The Interior or discoidal Parts of the Superior Wing described.*

The parts coloured *Green*, are the FAN TENDONS, and MEMBRANES, marked in numerical order; viz. 1st, 2nd, 3rd, &c.

PAPILIONES have only five of these MEMBRANES, and six TENDONS.

The parts coloured with *Pale Crimson*, are the TABLES. The *Pale Blue*, shows the SECTORS.

Shoulder MEMBRANE—*Yellow*.

Slip MEMBRANE—*Pale Orange*.

Long MEMBRANE—*Pale Indian Ink*.

The parts coloured Purple, are the SECTOR TENDONS and MEMBRANES, and it is in this part of the Wing only wherein one GENUS differs from another.

The Grand Tendons are coloured deep Red, and are three in number; viz.

- 7* Long Tendon,
- 8* Principal Tendon,
- 9* Shoulder Tendon,
- 10* Table Tendon.
- 11* Slip Edge.
- 12* Bar Tendon.

### *Interior or discoidal Parts of the Inferior Wing described.*

Green, shews the FAN TENDONS, and MEMBRANES, which are the same in number as in the Superior Wings.

Pale Crimson, shews the TABLE MEMBRANE.

Blue. The Sector.

Yellow. TABLE MEMBRANE OR BENT, ditto.

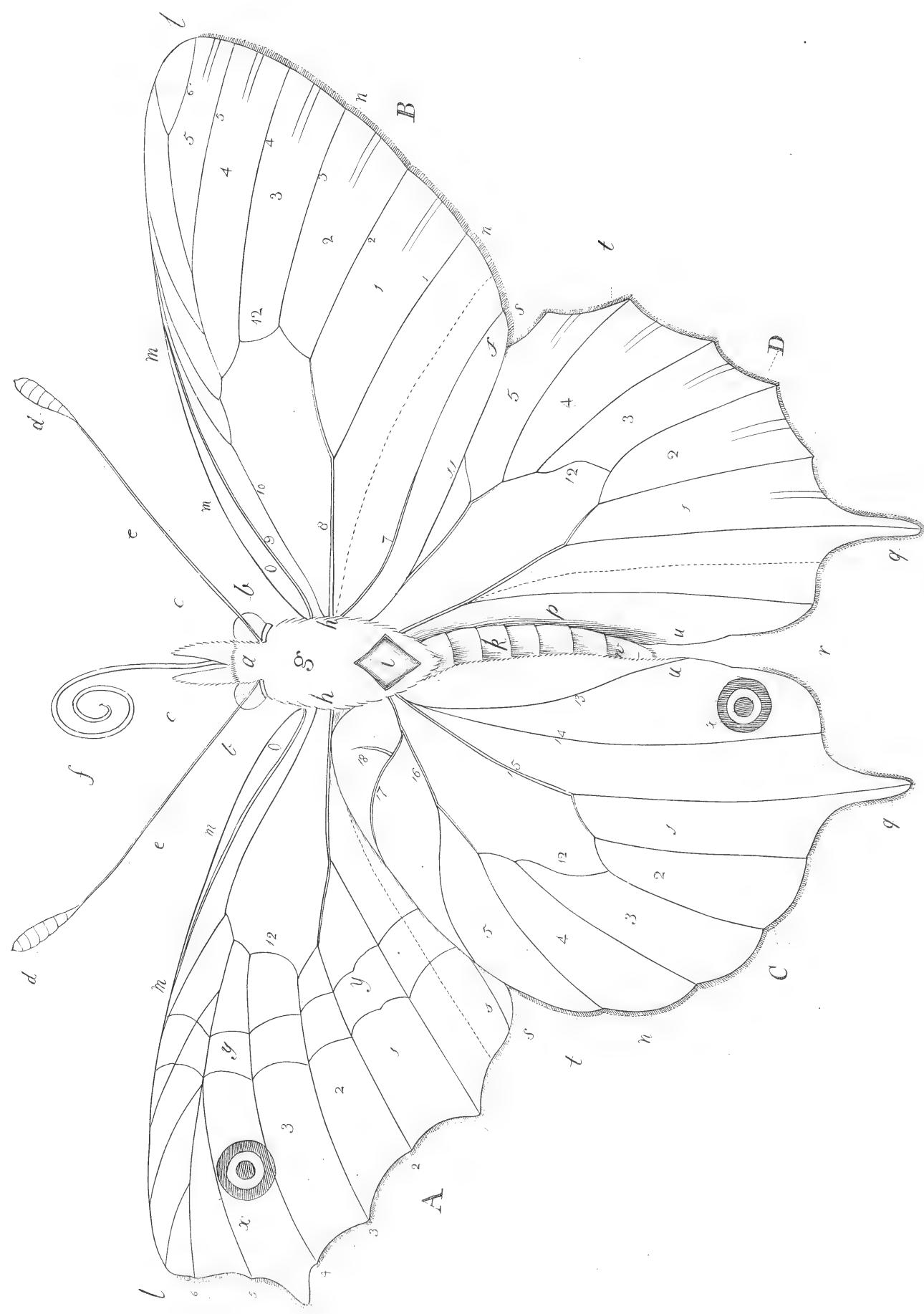
Pale Indian Ink. LONG MEMBRANE.

Pale Orange. ACUTE MEMBRANE.

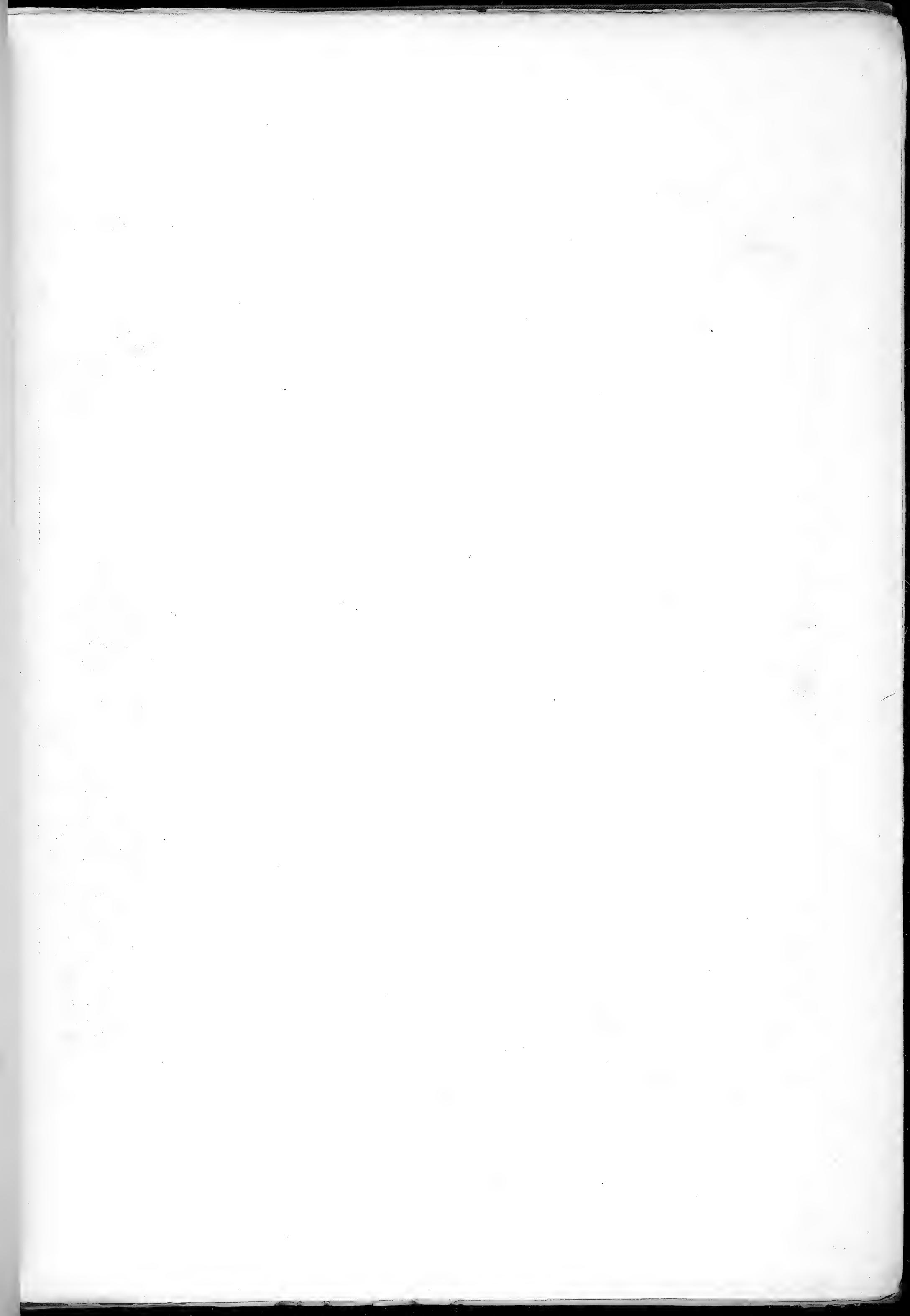
Deep Red. GRAND TENDONS, three in number; viz.

- 15* POSTERIOR TENDON,
- 16* TABLE TENDON,
- 17* BENT or FEMORAL TENDON,
- 18* Spur; this part answers to that little instrument in the Phalænæ, called the Spring.
- 13* Abdominal Tendon.
- 14* Long Tendon.

It is worthy of remark, that although the several parts of the Inferior Wings greatly correspond with the respective parts of the Superior, yet here are no parts answerable to the Sector Tendons and Membranes, and which are distinguished with purple in the Superior; but Providence seems to have supplied that deficiency, if I may call it one, by adding another on the opposite edge of the wing, called THE ABDOMINAL MEMBRANE, and which is coloured Purple.









## THE AURELIAN.

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### VANESSA C. ALBUM. THE COMMA BUTTERFLY.

Plate I. fig. *a—d*.

SYNONYMS. *Papilio C. Album*, *Linn. Syst. Nat.* ii. 778. *Lewin Papil. of Gr. Brit.* pl. 5. *Donovan Nat. Hist. Brit. Insects*, vol. 6. pl. 199.  
The Comma Butterfly, *Wilkes Eng. Moths & Butt.* pl. 109. *Albin's Ins.* pl. 54.  
*Vanessa C. Album*, *Ochsenheimer, Curtis, Stephens.*  
*Polygonia C. Album*, *Hubner.*  
*Comma C. Album*, *Rennie Conspect. Butterfl.*

*Upper Side.* The head, thorax, and abdomen are dark brown; the wings are of a fine orange brown, spotted with black; the fan edges being deeply indented or jagged.

*Under Side.* The wings seen at (*d*) are clouded with a variety of dark brown and olive shades: and near the middle of the inferior wing is a small white spot, in form like the stop called comma in printing.

The caterpillar seen at (*a*) feeds on hops and nettles, and is remarkable for the back part being half red, and the other half white. It changes to the chrysalis, hanging by the tail, and the fly appears in about fourteen days. There are two broods a year: the first appears in June, the second in August; which remains during the winter, in the fly state.

Expansion of the wings almost two inches.

This butterfly varies considerably in its markings on the underside of the wings, in different individuals. The caterpillars feed also on the elm, willow, hazel, honey-suckle, &c. It has become much rarer of late years than formerly, although still by no means a scarce insect in the southern half of the kingdom. The caterpillar is described by Fabricius as being of a fulvous colour, with the back yellow in front, and white behind. The peculiar form of the wings of this and some allied species, have caused it to be formed into a distinct sub-genus by Hubner, who names it *Polygonia*; Kirby also has proposed for it the name of *Grapta* in his *Fauna Boreali-Americana*, whilst Rennie more conceitedly terms it *Comma*.

### ANTHROCERA FILIPENDULÆ. THE SIX SPOTTED BURNET MOTH.

Plate I. fig. *e—i*.

SYNONYMS. *Sphinx Filipendulæ*, *Linn. Syst. Nat.* ii. 805. *Donovan Brit. Ins.* vol. i. pl. 6.  
*Zygæna Filipendulæ*, *Fabricius, Haworth, Curtis Brit. Ent.* pl. 547. *Wilkes Eng. Moths*, pl. 91. fig. sup.  
*Anthrocera Filipendulæ Scopoli, Stephens, Duncan Brit. Moths*, pl. 2. fig. 4.

*Upper Side.* The head, antennæ, thorax, and abdomen, are of a dark blue green, nearly black. The superior wings are of a fine shining green, like satin, having thereon six spots, of a fine deep red colour. The inferior wings are red, bordered with a black fringe.

The *under side* is similar to the upper.

The caterpillar is black and yellow, as at (e) and feeds upon hay grass, changes to the chrysalis, in a silken case, as at (f) about the end of May: and the moth appears at the end of fourteen days. They remain during the winter in the caterpillar state. The chrysalis is seen at (i).

The caterpillar of this moth is sometimes stung by a small musca, [one of the numerous species of the modern Dipterous genus *Tachina*] termed by Aurelians *Ichneumon* (as they call all those without exception, which feed on the inside of caterpillars); which laying its eggs, or injecting them into the body of the caterpillar, there hatch, and the young ones feed on its flesh, till they arrive at full size; when, eating their way out through the skin, they change into round black chrysalides, leave the caterpillar shrunk and dying: and in about ten days small flies appear in the likeness of the parent. See the figures at (k) (l) (m) (n). This moth, when first taken, will lie in the hand as if dead, although unhurt.

Expansion of the wings 1— $1\frac{1}{2}$  inch.

This insect is very abundant throughout the country. It flies by day in the brightest sunshine in grassy places; but its flight is slow and heavy, and quite unlike that of the Hawk-moths.

#### PTEROPHORUS PENTADACTYLUS. THE WHITE PLUMED MOTH.

Plate I. fig. o—q.

SYNONYMS. *Phalaena (Alucita) pentadactyla*, *Syst. Nat.* ii. 900. *Donovan Brit. Ins.* 4. pl. 110. *Pterophorus Pentadactylus*, *Fabricius*, *Leach*, *Curtis*, *Stephens*.

The moth is totally white, and the wings are as if composed of feathers.

The caterpillar feeds on grass, is green, having a whitish stripe on the side, as at (p), and changes to the chrysalis, in the manner shewn at (o), the beginning of June; the moths appear about the end of that month. They haunt about the sides of ditches.

Expansion of the wings one inch.

This is a very common species; frequenting grassy places, and flying in the twilight. When at rest the feathers of the wings are folded upon each other, so as to appear to consist of only a single feather. The mode of suspension of the chrysalis is especially interesting; agreeing in this respect with various butterflies, and quite unlike the majority of the moth-tribes.

#### SPHINX LIGUSTRI. THE PRIVET HAWK-MOTH.

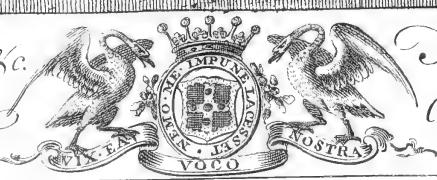
Plate II. fig. a—h.

SYNONYMS. *Sphinx Ligustri*, *Linn. Syst. Nut.* ii. 799. *Donovan Brit. Ins.* 8. pl. 248. *Albin's Ins.* pl. 7. *Wilkes Eng. Moths*, pl. 22. *Duncan Brit. Moths*, pl. 4. f. 2.

*Upper Side.* The antennæ, head, and sides of the thorax are of a reddish-ash colour, the nose or ends of the palpi dark brown. The upper part of the thorax, is almost black, the middle being of a purplish grey. The abdomen is of a deep rose-colour, the annuli being strongly marked with bars of black, which are interrupted by a broad list down the upper part, reaching from the thorax to the anus. The superior wings are of a light brown toward the sector edge, but toward



To the Right Hon<sup>ble</sup> EARL BROOKE &c.  
His Lordship's most



This Plate is Humbly Inscribed by  
Obedient & Devoted Servant  
Moses Harris.



the slip-edge, very dark, and having lines of black in several parts, particularly one in the middle of the wing something like a dagger.

The caterpillar is green, as seen at (c), having a black horn at the tail, and seven oblique stripes on the sides of purple and white; on each side the head, is a strong black mark. The excrement of this caterpillar is of a remarkable form and size, by which the caterpillar may be easily discovered, by seeking for it under the privet or lilac on which the caterpillar feeds, the caterpillar not being far from the place where it is found. The young caterpillars when they come from the eggs have their tails remarkably long, as seen at (a) and (h); when they have changed about four skins, and arrived to be full fed as at (c), they go into the earth, where they change into a dark brown chrysalis, of the form and size as at (c), in August; the moths appear in June following.

Expansion of the wings  $3\frac{1}{2}$ — $4\frac{3}{4}$  inches.

This is by far the most common species of the larger Sphingidæ which inhabit this country; the caterpillar being commonly found on privet hedges in various parts of the south of England, it is however far rarer in the northern districts. The internal analogy of this insect has recently been elaborately investigated by George Newport, Esq. whose papers have been published in the Philosophical Transactions of the Royal Society.

#### VANESSA URTICÆ. THE TORTOISE-SHELL BUTTERFLY.

Plate II. fig. i—n.

SYNONYMS. *Papilio* (Nymph. Phal.) *Urticæ*, *Linn. Syst. Nat.* ii. 777. *Lewin's Papil.* pl. 3. *Donovan Brit. Ins.* vol. 2. pl. 55.

*Vanessa Urticæ*, *Ochsenheimer*, *Leach*, *Curtis*, *Stephens*. *Duncan Brit. Entt.* pl. 19. f. 2.

The Lesser Tortoise-shell Butterfly, *Albin's Insects*, pl. 4. f. 6. *Wilkes Eng. Moths & Butt.* pl. 107. f. 4.

*Upper Side.* The head, thorax, and abdomen are nearly black, clothed with dark yellow hair. The wings are of a full orange colour, spotted with black. The fan edges, which are scalloped or indented, have a handsome double brown border, in which are placed at equal distances arch-like spots of blue.

The *under side* seen at (n) is of a pale brown, like a withered leaf, darkly clouded near the body; the border on this side is embellished with green spots.

The caterpillars when young are nearly black, as at (i), and herd together; but when full fed they separate, keeping only two or three together on a leaf: they change into chrysalis hanging by the tail, and shining like burnished gold, the beginning of June; the fly appears in about three weeks. There are two broods in a year of this fly, another brood appearing in August, and remaining during the winter in the fly state.

Expansion of the wings  $1\frac{5}{6}$ — $2\frac{1}{3}$  inches.

This is one of our commonest and handsomest butterflies, frequenting our gardens, and remaining with us till the end of the autumn. It is also very widely distributed, being found as far as the north of Scotland, in which part of the kingdom it is called the Devil's or Witch's Butterfly! It is also one of the first seen in the spring; the first warm day in March bringing forth specimens, the faded colours of which evidently shew them to have been produced in the preceding autumn, and to have hyberuated. That such is the case is evident from the circumstance mentioned by Mr. Bree, (*Mag. Nat. Hist.* 5. p. 595,) that it had been seen

in the Isle of Wight in January. It has been generally supposed that these were females, which had been impregnated late in the previous autumn, and had consequently the instinct not to deposit their eggs until the following spring should produce a supply of fresh food for their young: but this is opposed by Boisduval, (*Hist. Nat. Lépid.* p. 29,) who asserts that they have undergone a state of lethargy from the commencement of the preceding autumn; whilst Mr. J. P. Brown (whose observations are made at Thun in Switzerland) states, that he has repeatedly seen this insect and *Gonepteryx Rhamni* in numbers by the 11th of February, and that he has no doubt that these were individuals which were but just disclosed, and that they appeared to him to have been males, (*Mag. Nat. Hist.* No. 39); but Mr. Bree has adduced various proofs in the same work (No. 42, p. 523) sufficient to shew that they certainly do hibernate in this country.

Mr. Stephens describes a singular monstrosity of this insect, presented to him by Mr. Doubleday, in which the right posterior wing has a perfect additional wing, about one-third of the size of the original, arising from near the base of the costal areolet, it is somewhat less angulated than the true wing, but its colours, both above and below, are very bright and disposed as usual; the proper wing is a little defective on its anterior edge, and is smaller than the other, as though shrivelled, and the new one which bears the additional one is incrassated.

This is one of the species of butterflies which discharge a drop of reddish fluid immediately after their arrival at the winged state, which is considered as analogous to the meconium of infants, and which was evidently the cause of those "showers of blood" which terrified our forefathers in the dark ages, and are recorded in the old chronicles: thus, in the fifth century "at Yorke, it rayned bloud;" and in 697 "corne, as it was gathered in the harvest time, appeared bloudie;" and "on the furthermost partes of Scotland it rayned bloud," (*Hollinshed*); and Gregory of Tours relates that a bloody rain was seen at Paris in divers places in the days of Childebert, also at the end of June in the days of King Robert, "so that the blood which fell upon flesh, garments, or stones could not be washed out, but that which fell on wood might." It is not to be supposed that so remarkable a circumstance could be regarded otherwise than as fearfully ominous; and accordingly, in 1553, it was deemed among the forewarnings of the deaths of Charles and Philip, Dukes of Brunswick, that there were "drops of bloude upon hearbes and trees," (*Batman's Doome*); and, in 1608, even some divines judged that this was the work of the devils and witches who had killed innocent young children. Pieresc, however, discovered the true nature of these dreaded showers of blood in a very simple manner, for having some months before "shut up in a box a certain palmer-worm which he had found, rare for its bigness and form, which, when he had forgotten, he heard a buzzing in the box, and when he opened it found the palmer-worm, having cast its coat, to be turned into a very beautiful butterfly, which presently flew away, leaving in the bottom of the box a red drop as broad as an ordinary sous or shilling; and because this happened about the beginning of the same month, and about the same time an incredible multitude of butterflies were observed flying in the air, he was therefore of opinion that such kind of butterflies resting upon the walls had there shed such like drops, and of the same bigness." (*Gassendi's Life of Peiresc, quoted by Hone.*)





Reaumur performed some curious experiments with the chrysalides of this species, with a view to discover the operation of heat and cold in forwarding or retarding the appearance of the butterfly. In ordinary summer weather fourteen days are required to mature them, but by placing the chrysalides under a hen they were hatched in four days, whilst by placing them in a cold cellar the butterflies did not appear until six weeks beyond the proper period.

The anatomy of this butterfly in its different states has been elaborately investigated by Swammerdam in his *Biblia Naturæ*.

APATURA IRIS. THE PURPLE EMPEROR BUTTERFLY,  
PURPLE HIGH-FLYER OR EMPEROR OF THE WOODS.

Plate III. fig. sup.

SYNONYMS. *Papilio (Nymph Gemm.) Iris*, *Linn. Syst. Nat.* ii. 775. *Lewin Pap.* pl. 16. *Donovan Brit. Ins.* vol. 2. pl. 37. *Wilkes Eng. B. & M.* pl. 120.  
*Apatura Iris*, *Fabricius*, *Ochsenheimer*, *Leach*, *Stephens*. *Curtis Brit. Ent.* pl. 338.  
*Duncan Brit. Butt.* pl. 21.

*Upper Side.* The antennæ, head, thorax, and abdomen are of a deep soot colour; the eyes are brown; the wings are of a dark soot colour, but when held in some positions seem to glow with a glorious purple. In the superior wings are ten spots of white, about the size of a hemp seed: and the inferior wings have a band or stripe of the same colour, which crosseth the middle part. Near the abdominal corner of each inferior wing is a small ring of orange colour; the abdominal edge is also tinged with the same colour. The female hath not that fine purple cast on the wings; is much larger, but in other respects similar to the male.

The *under side* is chiefly red-brown and ash colour, having the white spots as on the upper side. It hath also two black spots on the table membrane, and a round black spot, about the size of a hemp seed, about the middle of the first fan membrane, which hath a small speck of light purple in the centre. The palpi, breast, and abdomen are on this side white in the female, and of a palish purple in the male.

The caterpillar feeds on sallow, and remains during the winter in that state; it is of a lovely green on the back, and of a pale blueish green on the belly. The head is shaped like a heart, having two long horns, like those of a snail, and about the same size, fixed to the upper part, and of the same hard substance with the head; the body is thickest in the middle part, and tapers to a point toward the tail; on each side are seven diagonal lines of a pale yellow; it is also freckled or frosted all over with small pustules, like shagreen, and is very slow in its motion. It changes into the chrysalis state the beginning of June, hanging by the tail to a wall or perpendicular place, with the head downward; it is in colour of a pale pea green, and flat, like a pea-pod, and the fly appears the latter end of that month.

Expansion of the wings  $2\frac{1}{2}$ — $3\frac{1}{4}$  inches.

This magnificent insect is by no means common; and the brilliant appearance of the males serves to keep up its high value with collectors. To this also must be added the difficulty with which the perfect insect is captured, owing to the velocity and loftiness of its flight. Its habits are thus described by Mr. Haworth in the 'Lepidoptera Britannica':—

"The Purple Emperor of the British Oaks is not undeservedly the greatest

favourite of our English Aurelians. In the month of July he makes his appearance in the winged state, and invariably fixes his throne upon the summit of a lofty oak, from the utmost sprigs of which, on sunny days, he performs his aerial excursions ; when the sun is at the meridian his loftiest flights take place, and about four in the afternoon he resumes his station of repose. He ascends to a much greater elevation than any other insect, sometimes mounting higher than the eye can follow ; especially if he happens to quarrel with another Emperor, the monarch of some neighbouring oak ; they never meet without a battle, flying upwards all the while, and combating with each other as much as possible, after which they will frequently return again to the identical sprigs from whence they ascended. The wings of this fine species are of a stronger texture than those of any other in Britain ; and more calculated for that gay and powerful flight which is so much admired by Entomologists. The females, like those of many other species, are rarely seen on the wing ; in three days I captured twenty-three ; nine of them in one day, and never took a female at all. The males fly very high, and are only to be taken by a bag-net, fixed to the end of a rod twenty or thirty feet long. There have been instances, though rare, of their settling on the ground near puddles of water, and being there taken. When the Purple Emperor is within reach, no fly is more easily taken, for he is so very bold and fearless that he will not move from his settling place until you quite push him off ; you may even tip the ends of the wings, and be suffered to strike again."

#### CHLORISSA THYMIARIA. THE SMALL GREEN HOUSEWIFE MOTH.

Plate III. fig. med. sinistr.

SYNONYMS. *Phalæna* (*Geometra*) *Thymiaria*, *Linn.*? *Haworth.* *Albin's Ins.* pl. 48. fig. 81. *d—g.*  
*Geometra Vernaria*, *Fabricius.* *Donovan Brit. Ins.* vol. 9. pl. 310.  
*Chlorissa Thymiaria*, *Stephens.*

*Upper Side.* This moth is totally of a blueish green colour, hath a narrow waved line crossing each wing, the fringe is checkered with light and dark green.

The *under side* is similar to the upper.

The caterpillars feed on white-thorn, and are full fed about the latter end of May : they are of various colours, some being green, others brown, as may be seen in the plate ; but the green sort are most frequently met with. They change into the chrysalis state the end of May, spun up in a net-like web ; and the moths appear the middle of June.

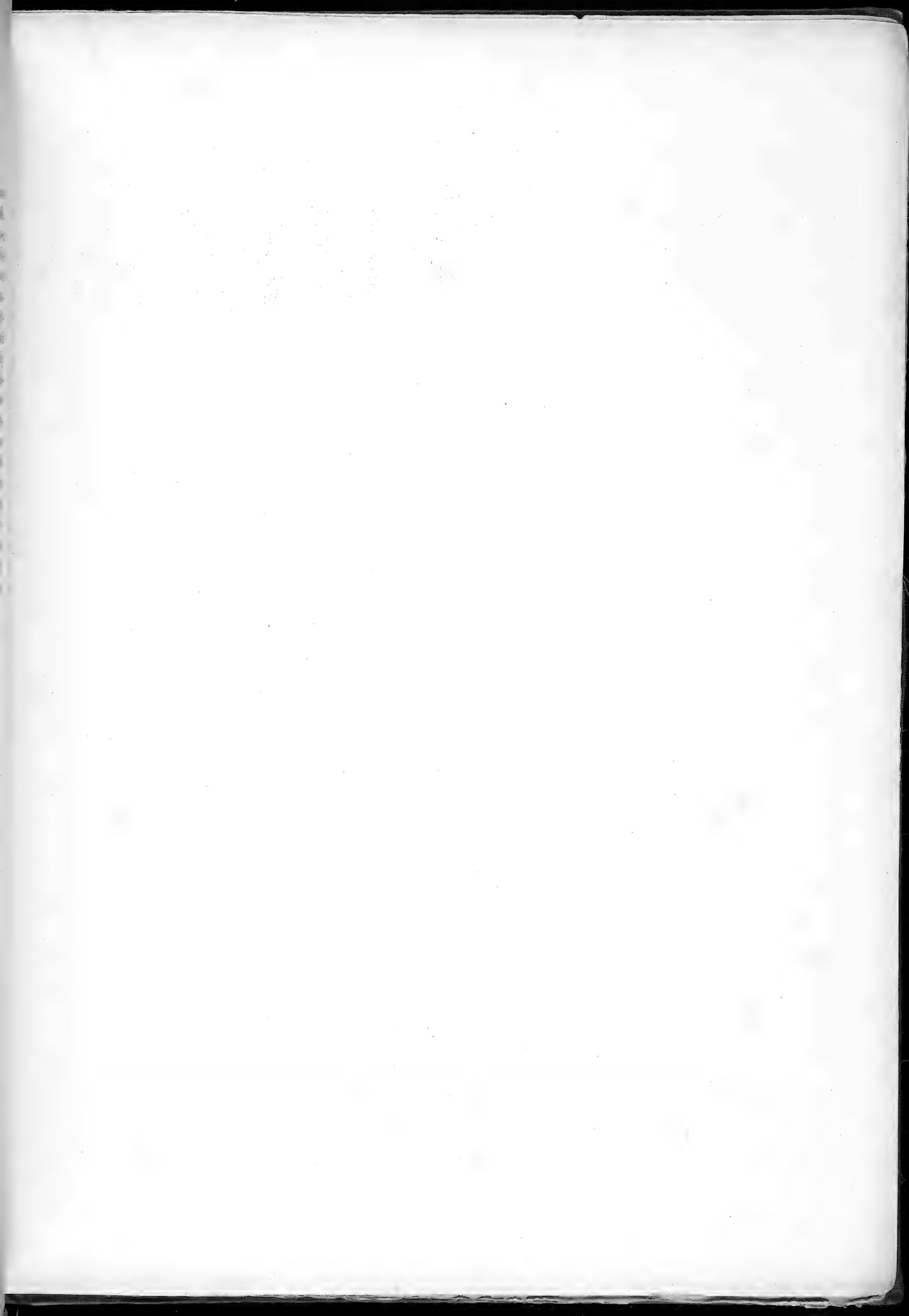
Expansion of the wings nearly one inch.

#### YPONOMEUTA PADELLA. THE SMALL ERMINE MOTH.

Plate III. fig. *k—m* (inf. sinistr.)

SYNONYMS *Phalæna* (*Tinea*) *Padella*, *Linn. Syst. Nat.* ii. 885. *Wilkes Eng. Moths*, pl. 5.  
*Yponomeuta Padella*, *Latreille, Leach, Stephens, Curtis.*  
*Phalæna Evonymella*, *Berkenhout* (sed nec *Linn.*) *Donov. Brit. Ins.* 1. pl. 9.

*Upper Side.* The superior wings are of a pale lead colour, covered with small black specks. The inferior wings are of dark lead colour, having a pretty deep fringe. The female lays her





M<sup>o</sup> Harris did. Verus.

To his Grace Henry Augustus Fitzroy,  
Duke of Grafton, Earl of Clinton &c.  
This Plate is most humbly Dedicated  
by his Graces most Obed. & faithful Servt.  
Nes<sup>o</sup> Harris.

eggs the middle of July, on the branches of the white-thorn and black-thorn, in which state they continue during the winter, and are hatched about the middle of April. The caterpillars feed inclosed in a large web, wherein they change to the chrysalis, when full fed, hanging by the tail in clusters ; and the moths appear about the end of June.

Expansion of the wings three-quarters of an inch.

This minute insect is one of the most destructive species of moths indigenous to this country ; not only attacking our white-thorn hedge-rows but also our fruit trees, which it sometimes completely defoliates. I have given some striking instances of its ravages in the eighth number of my series of articles on the insects most injurious to cultivators, published in Mr. Loudon's Gardener's Magazine, October, 1837.

CALLIMORPHA JACOBÆÆ. THE PINK UNDERWING, OR  
CINNABAR MOTH.

Plate IV. fig. sup. dextr.

SYNONYMS. *Phalæna* (Noct.) *Jacobææ*, *Linn. Syst. Nat.* ii. p. 839. *Donovan*, ii. pl. 45. *Albin's Ins.* pl. 34. fig. 55. *e—i.* *Wilkes Eng. Moths*, pl. 55. *Lithosia Jacobææ*, *Haworth*. *Callimorpha Jacobææ*, *Latrielle*, *Stephens*. *Curtis Brit. Ent.* pl. 499. *Duncan Brit. Moths*, pl. 21. fig. 2.

*Upper Side.* The antennæ, head, thorax, and abdomen are totally black. The superior wings are of a fine soot colour, having a long streak of red along the sector edge, and two round spots of the same colour on the fan edge. The inferior wings are of a fine deep crimson, inclining to scarlet, having a black fringe. I have shewn this insect in three different positions, the better to display its parts : two are seen as flying, the other hanging by the feet, to dry its wings, as supposed new come forth from the chrysalis.

The caterpillar is found the latter end of July, feeding on the ragwort. It changes into chrysalis the beginning of August, on the surface of the earth, in which state it lies during the winter ; and the moth appears in May, or toward the latter end of that month.

Expansion of the wings  $1\frac{1}{4}$  to nearly 2 inches.

This is a very common species, frequenting lanes and road sides, especially where the food of the caterpillars grows in any abundance.

ARCTIA VILLICA. THE CREAM SPOTTED TYGER MOTH.

Plate IV. fig. inf.

SYNONYMS. *Phalæna* (*Bombyx*) *Villica*, *Linn. Syst. Nat.* ii. 820. *Donovan Brit. Ins.* pl. 71. *Albin's Ins.* pl. 21. fig. 29. *a—d.* *Wilkes Eng. Moths*, pl. 47. *Eyprepia Villica*, *Ochsenheimer*, *Curtis*. *Arctia Villica*, *Schrantz*, *Stephens*. *Duncan Brit. Moths*, pl. 20. fig. 2.

*Upper Side.* The antennæ, head, and thorax are black ; but on each side of the latter is a large spot of a cream colour. The superior wings are also black, have a number of spots, rather large, dispersed over the wing, of various forms, particularly one near the thorax, shaped like a

heart. The abdomen is yellow, but red toward the anus. The inferior wings are of a golden yellow spotted with black. The female moth is seen flying at (g), the upper one of which shews the under side, which is much like the upper; the male is seen at (h); they fly in the day.

The caterpillars may be found on banks which face the rising sun, where they feed on nettles, chick-weed, &c.; they are brown and covered with hair; the head and eyes are red. When full fed, which happens about the end of April, they make a large spinning, wherein they change into a black chrysalis; the moths appear about the middle of May. They continue during the winter in the caterpillar state.

Expansion of the wings 2—2½ inches.

#### SMERINTHUS OCELLATUS. THE EYED HAWK-MOTH.

Plate V. fig. a—i.

SYNONYMS. *Sphinx Ocellata*, *Linn. Syst. Nat.* ii. 796. *Donovan Brit. Ins.* 8. pl. 269. *Albin Ins.* pl. 8. *Wilkes Eng. Moths*, pl. 24.  
*Smerinthus Ocellatus*, *Latreille, Stephens. Curtis Brit. Ent.* pl. 482. *Duncan Brit. Moths*, pl. 3. fig. 1.

*Upper Side.* The antennæ are of a buff colour, and armed with little teeth, like a saw, on the outer side. The head and thorax are of blooming ash colour; but on the upper part of the latter is a large spot, of a deep chocolate colour. The superior wings are of an ash colour, inclining to a pink, handsomely clouded with olive brown. The abdomen is brown; the inferior wings are of rosy red toward the thorax, but toward the fan edges of a light and pleasant brown: the abdominal corners are remarkable for having a spot on each, formed like the eye of a bird, composed of a large black spot, in which is a ring or circle of blue about the size of a pea.

The moth is shewn at (i) in its natural posture when at rest, and at (h) for the under side. The caterpillar is green, and about three inches long, having a blueish horn at the tail; the head is triangular, and the body frosted all over like shagreen, on each side are seven oblique stripes of pale yellow: it feeds on willow, and is full fed about the beginning of September, when it goes into the earth and changes to the chrysalis; and the moth appears the latter end of May. The eggs are green, and are fixed by the parent to the branches and leaves; and the young caterpillars, which are also green, appear in about ten days after they are laid; see the figures (e) and (a).

Expansion of the wings 2½—3½ inches.

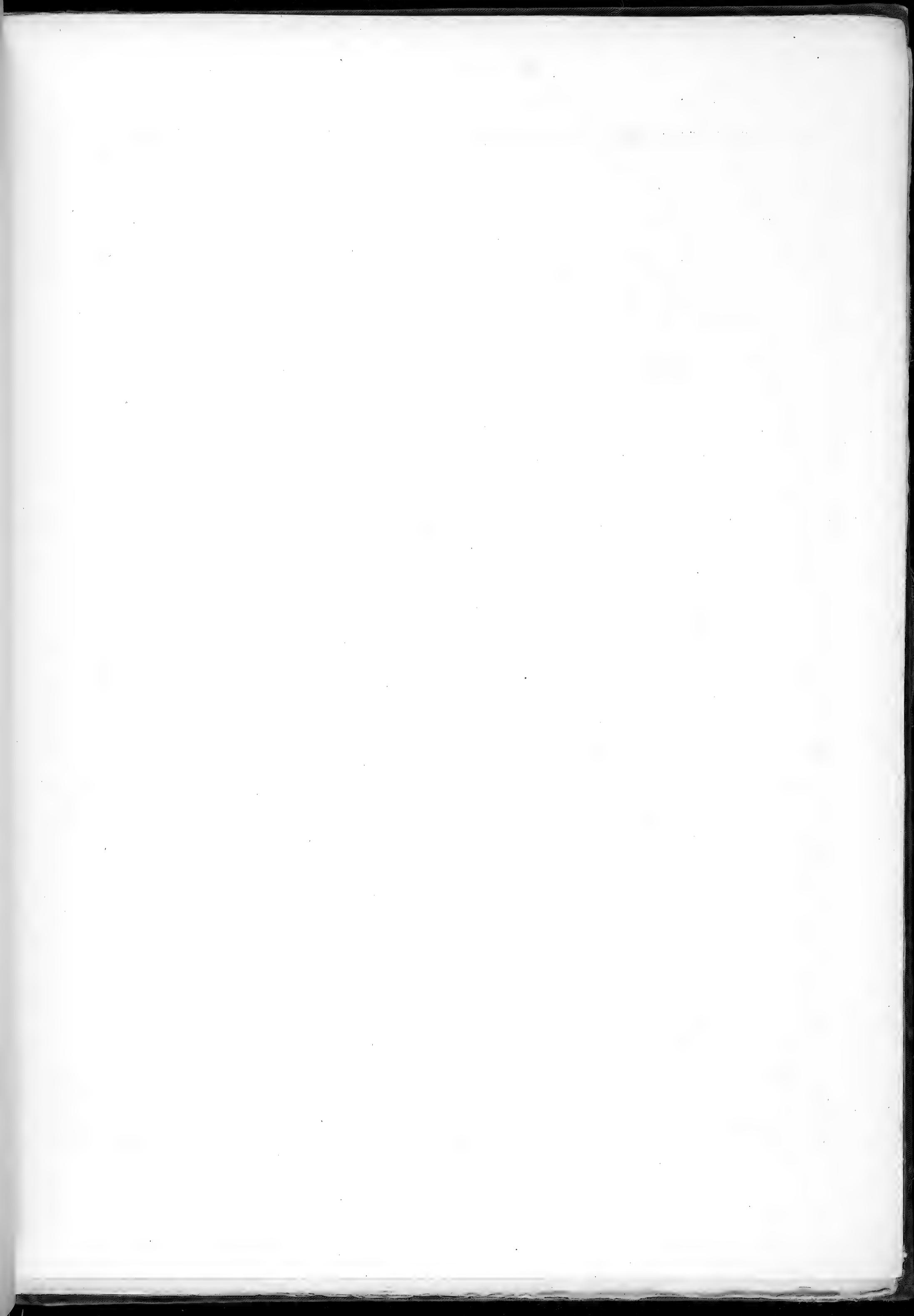
This moth is often infested with a small brown caterpillar covered with hair, several of which I have taken out of the abdomen while the moth has been alive, and in seeming good health: they have six feet, and in form as seen at (k); they change into a nympha, in which they remain about eighteen days, then produce the beetle, seen at (m), [which is the *Dermestes lardarius*, *Linn. Syst. Nat.* ii. 561, and all other authors.]

This insect is abundant in all the southern parts of the country, but is of great rarity in Scotland. In the Magazine of Natural History (No. 54) is contained a statement by P. J. Brown. Esq., that females of this insect, as well as *S. populi* and *Arctia Caja*, had been known to produce fertile eggs without any connexion with the male.

The insects of this genus differ materially in their habits from the larger Hawk-moths, being much more sluggish, and flying but slowly. This peculiarity is in evident connexion with the weak conformation of the spiral tongue, which is very short, and consequently unfitted for being introduced into long-lobed flowers.









To her Grace the  
Duchess of Grafton  
This plate is most humbly Inscribed  
by her Graces most Obedient & faithful Servt.  
Wes: Harris



## LEUCOMA SALICIS. THE WHITE SATIN MOTH.

Plate V. fig. sinistr.

SYNONYMS. *Phalæna* (Bomb.) *Salicis*. *Linn. Syst. Nat.* ii. 822. *Donovan Brit. Ins.* vol. 1. pl. 30.  
*Albin's Ins.* pl. 84. fig. a—d. *Wilkes Eng. Moths*, pl. 41.  
*Leucoma Salicis*, *Stephens*.

*Upper Side.* The eyes are black, the legs spotted with black, the other parts are white, the wings appearing like white satin. The eggs of this moth are green, usually laid against the bark of the willow, covered with a white substance, which appears like white satin. These are hatched in about twenty days.

The caterpillars feed on the willow leaves during part of the summer, and remain during the winter in a sleeping state; they are full fed about the latter end of June following, and making a spinning among the leaves, change to the chrysalis therein; the moth appears the end of July. The chrysalis is shewn at (m), and the caterpillar at (n).

Expansion of the wings  $1\frac{1}{2}$ —2 inches.

VANESSA ATALANTA. THE ADMIRABLE [OR RED ADMIRAL]  
BUTTERFLY.

Plate VI. fig. a—h.

SYNONYMS. *Papilio* (Nymph. *Phal.*) *Atalanta*, *Linn. Syst. Nat.* ii. 779. *Lewin's Papil.* pl. 7.  
*Donovan Brit. Ins.* vol. 8. pl. 260.  
*Vanessa Atalanta*, *Fabr. Ochsenheimer*, *Leach*, *Curtis*, *Stephens*, *Latreille*. *Duncan Brit.*  
*Butt.* pl. 20. f. 1.  
*Papilio Major*, &c. *The Admiral*, *Petiv. Papil.* pl. ii. f. 11.  
*The Admirable*, *Albin's Insects*, pl. 3. *Wilkes Eng. Moths & Butt.* pl. 105.  
*Pyrameis Atalanta*, *Hubner*, *Verz. Bek. Schmetterl.* coit. 70.  
*Ammiralis Atalanta*, *The Alderman*. *Rennie Conspectus*, p. 10.

*Upper Side.* The antennæ are black, speckled regularly with white, the knobs tipped with yellow. The eyes are dark brown. Thorax and abdomen black. The wings are also black. The superior have a broad diagonal band or list of a fine scarlet red crossing each wing, and six white spots near the tip. The inferior wings have a broad border of scarlet along the fan edge, in which are four triangular black spots. The legs, breast, and palpi are brown.

The *under side*, seen at (h), of the superior wings is like the upper side, except some additional blue waved lines, and the tips of the wings marbled with brown and white. The inferior are on this side, beautifully marbled with brown and other dark shades, not easily described.

The caterpillars feed on nettles; each spins up among the leaves, which it draws together with its web for that purpose, as shewn at (a): sometimes they cut the stalk of the nettle in two, causing it to hang down, as at (b), in which the subtile creature conceals itself among the leaves, which soon become withered and dry.

The caterpillars are black when young, as at (f), but when near full fed, they are of two colours; some black, others yellow, as seen at (d) and (c). They change into chrysalis, spun up in the leaves, the middle of July, and the fly appears in about three weeks. The chrysalis is of a fine pearl colour, sometimes embellished with silver.

Expansion of the wings  $2\frac{1}{2}$ —3 inches.

The habits of this, one of the commonest but most beautiful of the British Lepidoptera, are thus pleasantly described by the author of a "Journal of a

Naturalist." This insect very rarely appears until late in September, and then so perfect and fresh in its plumage as to manifest its recent production from the chrysalis. In some years they abound, and we may see twenty of these beautiful creatures expanding and closing their brilliant wings upon the fruit trees on our walls, or basking in the disc of some autumnal flower; and at another perhaps hardly a specimen is to be obtained: nor do they seem like the wasp, to be scarce or abundant according to the deficiency or plenty of the season, but influenced by other causes. Many of our butterflies are produced by successive hatches supplying the places of those which have been destroyed, and here it is difficult to mark the duration of an individual; and others, as the nettle, peacock, and wood-tortoise, in many instances, survive the winter hidden in some recess or sheltered apartment, appearing in the spring time worn and shabby. But *V. atalanta* appears only in the autumn, not as a preserved creature, but as a recent production; and here we can ascertain the duration of its life to be comprised only of September to the end of October, by which time its food in our gardens has pretty well disappeared. Some sheltered wall, garnished with the bloom of the ivy, may protect its being a little longer, but the cold and the dampness of the season soon destroy it, rendering the life of this creature, the most beautiful of our Lepidopterous tribes, of very brief duration."

Mr. Jonathan Couch has recorded some instances of boldness in this species, (*Mag. Nat. Hist.* No. 25), a specimen having allowed him to approach it with his fingers so closely as to lead him to think it was blind, not appearing to notice movements at about three inches distance; others manifested so strong a relish for some rotten pears that he took them off with his fingers, over which they crawled without fear. Mr. Lukis has also detailed some similar familiarities effected with this insect in the same work, (No. 33).

Sepp informs us, that the young caterpillars, almost as soon as hatched, have the instinct to spin several threads, in order to draw together the edges of a leaf into a roundish hollow form, leaving for the most part an opening into the interior before and behind. The leaf, when thus drawn together, serves as a house or tent for the little creature, and at the same time furnishes it with food; and hence the longer it lives in it the more perforated it becomes. When it has gnawed so much as to render the leaf useless as a defence, it selects a new leaf, proceeding with it in the same manner as it did with the first. Sepp considers that this habit results from its solitary mode of life, the eggs also being deposited separately; and it being well known to Naturalists that all caterpillars originating from eggs thus deposited are solitary, as those originating from clustered eggs are gregarious. These caterpillars, like all others, cast their skins several times; and Sepp gives the following dates of two which were hatched on the 12th of July. Their first casting of the skins occurred on the 14th, the second on the 17th, the third on the 21st, and the fourth on the 26th. They then continued to eat till the 15th of August, when they prepared to enter the pupa state, which circumstance took place on the 17th of August.

In the Magazine of Natural History, No. 31, January 1833, the Rev. W. T. Bree has figured an insect from the Himalayan Mountains, strongly resembling this species, or rather it is intermediate between it and *Cynthia Cardui* (plate II.).





To his Excellency Baron Kniphausen,  
to the Court of Great Britain,  
by his Excellency's most Obliged &

Embassador from his Prussian Majesty,  
This Plate is most humbly Inscribed,  
faithful Servt. H. Harris.

M. Harris ad. Novem. 1751

and it is interesting as shewing the nice and beautiful gradations which nature makes between one insect and another, borrowing as it were certain characters respectively from each of these nearly allied species, in order to make up a third, distinct from either; thus ringing the changes as it were with colour, markings, &c. beautifully illustrating the Linnæan aphorism, "Natura non facit saltus." This species is the *Vanessa Vulcana*, and has been figured both by Cramer and Herbst as a variety of *V. Atalanta*.

Specimens regarded as specifically identical with our European ones have been found in the northern parts of Africa, as well as in North America. It is the opinion of some authors, however, that these last belong to a distinct species. Mr. Kirby nevertheless in his *Fauna Boreali-Americanæ* gives them as *V. Atalanta* without any expression of doubt.

#### BOTYS URTICATA. THE SMALL MAGPIE MOTH.

Plate VI. fig. *l*—*p*.

SYNONYMS. *Phalæna (Geometra) Urticata*, *Linn. Syst. Nat.* ii. 873. *Donovan Brit. Ins.* 60. pl. 349.  
*f. 2. Albin's Ins.* pl. 37. fig. 60. *i*—*m*.  
*Scopula Urticata*, *Curtis*.  
*Eurrhypara Urticata*, *Hubner*, *Steph. Illustr. Haust.*

*Upper Side.* The head, thorax, and abdomen are yellow, as is that part of the superior wings near the shoulders; all the wings are white, handsomely spotted with black.

The caterpillars are green, and somewhat transparent, having a dark line the length of the back. They feed spun up in a leaf of a nettle, like the Admirable at (*a*), wherein they remain till the cold weather approaches, when they begin to change their colour to a red, as at (*m*); they then spin themselves up, each in a buff-coloured case, through which the caterpillar may be seen, as figured at (*n*): when they have lain about a month they change again to a yellow, and in May following put on the form of the chrysalis, which is red and shining: the moths appear about the beginning of June. They conceal themselves among the nettles, settling on the under side of the leaves, with their wings spread flat.

Expansion of the wings one inch and a quarter.

This is a very common species, frequenting hedges and damp places in the neighbourhood of nettles.

#### METOPSILUS ELPENOR. THE ELEPHANT HAWK MOTH.

Plate VII. fig. *a*—*h*.

SYNONYMS. *Sphinx Elpenor*, *Linn. Syst. Nat.* ii. 801. *Donovan Brit. Ins.* 4. pl. 122. *Albin's Ins.* pl. 9. *Wilkes Eng. Moths*, pl. 26. *Samouelle's Compend.* pl. 6. f. 2.  
*Deilephila Elpenor*, *Ochsenheimer*, *Curtis*, *Stephens*.  
*Eumorphæ (Oreus) Elpenor*, *Hubner*, *Verzeichn. bek. Schm. Coit.* 365.  
*Metopsilus Elpenor*, *Duncan Brit. Moths*, pl. 11. fig. 1.

*Upper Side.* The antennæ and palpi are rose-coloured. Thorax olive, striped with rose colour. The superior wings are of a beautiful yellow-olive, having some bars of rose colour crossing them. The inferior wings are rose-coloured; but towards the thorax black. The abdomen is olive, having a stripe of rose colour down the back part.

The caterpillar feeds on white-ladies bedstraw, on which are figured the eggs and young caterpillars, at (a) and (b), when they are full fed they are of two colours, green and brown, which shews the sexes in this state; the green being the female, and the brown the male. I have given a figure of each, in the plate at (c) and (d), the latter is shewn as drawing its head into the body, a peculiarity natural to this insect. They change into the chrysalis state, figured at (e), within a spinning among the leaves in August, and the moths appear in May following, one of which is seen at (f), shewing its under-side.

This insect is frequently destroyed by a certain species of ichneumon (*Ichneumon lentorius*, *Panz. Faun. Ins. Germ.* 71, *fig. 11* ? *Ichn. fusorius*, *Linn. ?*) shewn at (g), which lays its eggs on the caterpillar, these when hatched feed on the inside; the poor tormented insect feels in this case perpetual hunger, and destroys its food with great eagerness till transformed to the chrysalis, but about the time when the moth is expected the ichneumon appears. The chrysalis at (h) is represented as broke open, shewing the ichneumon within, as it is when near the time of its appearance in the winged state.

This is the commonest species of Hawk-moth found in England, frequenting marshy situations, where its favourite food, the ladies bedstraw, occurs. It however feeds also on the hairy willow herb, the loosestrife, the common vine, &c. Mr. W. Christy mentions that the larvæ of this species also fed upon the American *Impatiens biflora*, which he gave them instead of the *Impatiens noli me tangere*, which they had previously eaten. Caterpillars which I have fed have attained their full size at the middle of July.

#### HYDROCAMPA LEMNATA. THE WHITE CHINA MARK MOTH.

Plate VII. fig. l—p.

SYNONYMS. *Phalæna* (Geom.) *Lemnata*, *Linn. Syst. Nat.* ii. 874. *Donov. Br. Ins.* vol. 8. pl. 266. f. 1. 2.  
*Hydrocampus Lemnata*, *Latreille*, *Curtis*, *Stephens* (*Cat.*)  
*Cataclysta Lemnata*, *Hubner*, *Stephens* (*Illustr.*)

*Upper Side.* The antennæ are like threads. The wings of the male are white, as shewn at (p); but those of the female are marbled with a faint yellowish brown: the inferior wings of each sex are ornamented with a beautiful black border.

The caterpillar is of an olive brown colour, and feeds spun up in duck weed, which is often seen to cover entirely the surface of ponds: it is discovered by little lumps or risings on the weed, such as are represented at (n) (n); these are the spinnings of the caterpillars, within which they change to the chrysalis, which is shewn at (m), and the moths appear in about fourteen days.

Expansion of the wings three-quarters of an inch.

#### CUCULLIA VERBASCI. THE WATER BETONY MOTH.

Plate VIII. fig. a—e.

SYNONYMS. *Phalæna* (Noct.) *Verbasci*, *Linn. Syst. Nat.* ii. p. 850. *Hubner*. *Haworth*. *Albin's Ins.*  
pl. 13. fig. 18. f—k.  
*Cucullia Verbasci*, *Ochsenheimer*, *Curtis*, *Stephens*.

*Upper Side.* The antennæ are like fine threads. The head, thorax, and abdomen are of a



To Sir Henry  
Ecklin Baronet  
This Plate is humbly Inscribed by his  
most Obliged & Obedient Servt Moses Harris



dark brown ; the two latter beautifully crested with tufts of hair. The wings are also brown, shaded with a very dark brown.

The caterpillar seen at (a) is of a clear white, covered with round black spots and some stripes, and in some parts tinged with yellow. It feeds on water betony and mullein ; goes into the earth about the beginning of June, where it changes to the chrysalis in an earthen case represented at (b), and the moth appears about the middle of April. The chrysalis is of an orange brown, as shewn at (c), having a remarkable protuberance about the middle part. The moth is seen flying at (d), and in a sitting posture at (e). It is remarkable that these caterpillars, most commonly eat their own skin after they have thrown it off ; and should they be so far neglected, as to want food, they will devour each other.

Expansion of the wings  $1\frac{3}{4}$  inches.

#### VANESSA IO. THE PEACOCK BUTTERFLY.

Plate VIII. fig. f—k.

SYNONYMS. Papilio (Nymph. Gemm.) Io, *Linn. Syst. Nat.* ii. p. 769. *Lewin Papil.* pl. 4. *Donov. Brit. Ins.* vol. 6. pl. 206.

Vanessa Io, *Ochsenheimer, Leach, Curtis, Stephens. Duncan Brit. Butt.* pl. 18. f. 1.

The Peacock's Eye, *Albin's Ins.* pl. 4. f. 5.

The Peacock Butterfly, *Wilkes Eng. Moths and Butt.* pl. 106.

*Upper Side.* The head, thorax, and abdomen are of a deep red brown, covered with rather long hairs. The superior wings are of a strong dark red, having an eye-like spot near the apex, about the size of a silver penny, or the nail of the fore finger : this is formed by a triangular black spot on one side, and a dark olive-coloured border on the other ; the pupil or centre is dark red, surrounded with an iris of blue and yellow. The inferior wings, near the thorax, are of a dark brown, sprinkled with yellow specks, the middle part only being red : here is also an eye-like spot, near the outer corner, about the same size as the other, which is blue in the centre, and surrounded with black.

The caterpillar, as at (g), is of a fine deep black, thickly beset with sharp spines : it is also finely powdered with minute white specks ; the hind legs are of a tawny brown, the others are black. It feeds on nettles, and changes into the chrysalis the beginning of July ; and the fly appears in three weeks after. The chrysalis is shown at (h).

The *under side* of the fly is almost black.

Expansion of the wings  $2\frac{1}{2}$ —3 inches.

This splendid butterfly, which were it but rare, would be as highly prized as any of our native species, is one of those which survive the winter and again appear in the early sunny days of the following spring. Mr. Bree records the capture of a specimen on the wing on the 5th of January, (*Mag. Nat. Hist.* Vol. 6. p. 176). Mr. Dale mentions having seen it at Christmas, in cutting down an old pollard hollow tree, and having also seen it flying at the end of January, (*Ibid.* p. 379). It is much more abundant in the southern than in the northern parts of the country. A remarkable variety is described in the *Magazine of Natural History*, No. 12, in which the eyes on the hind wings are obliterated.

## AMPHIDASIS HIRTARIUS. THE BRINDLED BEAUTY MOTH.

Plate IX. fig. *a—f*.

SYNONYMS. *Phalaena* (Geom.) *hirtaria*, *Linn. Faun. Suec.* no. 1236. *Hubner. Haworth. Albin's Ins.* pl. 39. fig. 62. *a—d. Wilkes Eng. Moths*, pl. 70. *Amphidasis hirtarius, Treitschke, Stephens.*

*Upper Side.* The antennæ are brown and pectinated. This moth is totally light brown, sprinkled all over with a darker brown; which also forms bars or stripes across the superior wings. The female is shown at (*l*); and is known from the male by the antennæ, which are more like threads.

The caterpillar feeds on moist fruit trees, as well as on privet, lime, and elm: it is of the looper kind, and goes into chrysalis about the beginning of July; which is seen at (*d*); the moths appear about the beginning of April; and may be taken early in the morning, sitting against the trees. They lay their eggs in the cracks and holes of the bark.

Expansion of the wings  $1\frac{1}{2}$  inch.

## PIERIS CRATÆGI. THE BLACK-VEINED WHITE BUTTERFLY.

Plate IX. fig. *g—h—i—k*.

SYNONYMS. *Papilio* (Parn.) *Crataegi*, *Linn. Syst. Nat.* ii. 758. *Lewin's Papil.* pl. 24. *Haworth Lep. Brit.* p. 6. *Donovan Brit. Ins.* vol. 13. pl. 454. *Wilkes Eng. Moths*, pl. 95. *Albin's Ins.* pl. 2. f. 2. *a—d. Pieris Crataegi, Latreille, Godart, Stephens. Curtis Brit. Ent.* pl. 360. *Duncan Brit. Butt.* pl. 11. fig. 2. *Boisduval Hist. Nat. Ins. Lép.* vol. i. p. 445.

*Upper Side.* The head, thorax, and abdomen are of a darkish grey. The wings are white, but all the tendons or veins are black.

The *under side* is similar to the upper, except the inferior wings, which are a little powdered with a darker colour.

The caterpillars inclose themselves within a spinning: and come forth morning and evening to feed, avoiding the heat of mid-day. In this web they remain during the winter, and in the spring come forth again to feed on the buds and tender leaves: when full fed they appear as represented at (*h*). When ready for their transformation, they fasten their tails by a strong web, after which they girt themselves with another round their middle, when at the expiration of twenty-four hours the chrysalis appears as represented at (*g*). The moths appear about the beginning of June; the male is shewn at (*i*), and the female at (*k*). They fly in corn-fields.

Expansion of the wings  $2\frac{1}{3}$ — $\frac{5}{6}$  inches.

The caterpillars of this butterfly ordinarily feed upon the white and black thorns, as well as apple and other fruit-trees. (Salisbury's Hints on Orchards, p. 56.) They are comparatively rare in this country, but on the Continent are occasionally so abundant as to become a pest of the gardens, as the species was called by Linnæus; and Pallas mentions, in his Travels, that he saw them flying in such vast abundance near the environs of Winofka, that he mistook them at first for flakes of snow. The eggs are deposited at the extremity of the branches, and securely covered with a coating of varnish. "In this state," observes Salisbury, "we have instances of their

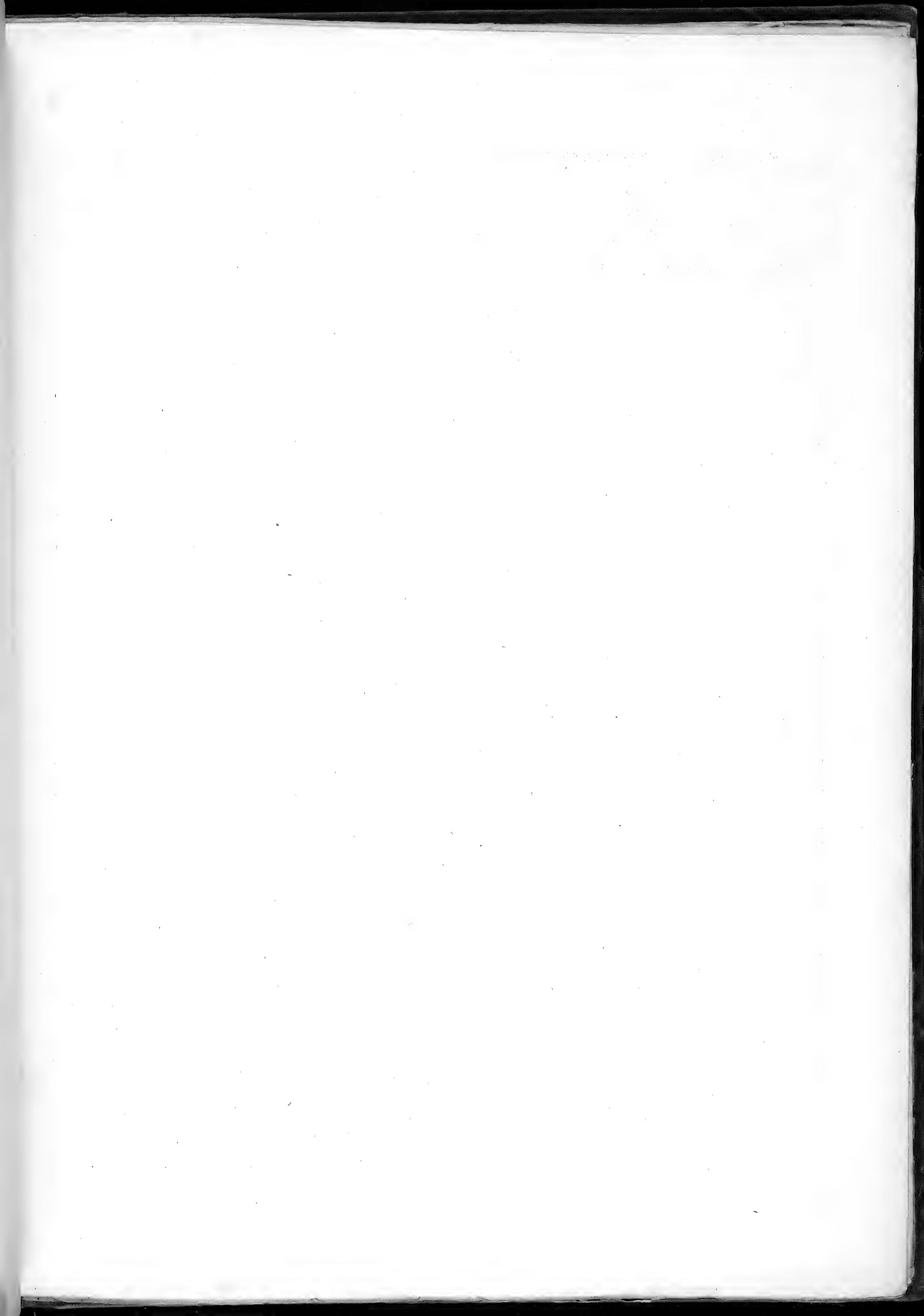


To the Right Hon<sup>ble</sup> Lord Viscount  
Inscribed by his Lordships most



Charlemont, this Plate is Humbly  
Obliged & Obedient Serv<sup>t</sup> Moses Harris.







M: Harris ad. R: Wm.

To the R: Hon: Lady Henrietta Alicia Wentworth  
This Plate is most humbly Dedicated by her Ladyship's most obliged, & obedient Servt:  
M: Harris

remaining without losing their vitality for several years, until a favourable opportunity of their being brought into existence arrives."

A long and interesting account of the ravages of this insect is published by Kollar, in his work upon obnoxious insects, (translated by Miss Loudon, p. 183), from the observations of the Canon Schmidberger.

The perfect insect appears to select the Chrysanthemum Leucanthemum, as Mr. H. Newman states, that on the 23rd of July, 1835, this butterfly was so abundant at Oldenbarn, near Leominster, that he took nearly thirty specimens with his fingers from that plant on which they had settled, (*Entomol. Mag.* No. 12, p. 208). It appears to be confined to the southern parts of England, being wholly unknown in Scotland.

The caterpillar of this insect has been observed to devour the shell of the egg from which it had been just previously hatched, (*Bonnet Œuvres*, ii. p. 18). When full fed they prepare for pupation by spinning a thread around the middle of the body, as well as by affixing themselves by the tail. Their proceedings during this operation have been carefully observed and described by Réaumur.

#### THECLA QUERCUS. THE PURPLE HAIRSTREAK BUTTERFLY.

Plate X. fig. *a—g*.

SYNONYMS. *Papilio* (Pleb. Rur.) *Quercus*. *Linn. Syst. Nat.* ii. 788. *Lewin Papil.* pl. 43. *Donovan Brit. Ins.* 13. pl. 460. *Wilkes Eng. Moths and Butt.* pl. 116. *Haworth. Albin's Ins.* pl. 52. fig. *a—c*.  
*Thecla Quercus. Leach, Stephens, Curtis. Duncan Brit. Butt.* pl. 3. ♂. nec ♀. 4. ♀. nec ♂.

*Upper Side.* The female is somewhat larger than the male, her wings are totally of a dark shining purple; but the male hath a lovely blue spot on each side of the superior wings, near the thorax: the rest of the wing being of a dark colour, nearly black. I have shewn the male at (*d*), and the female at (*e*).

The *under side* is seen at (*g*), which are in both sexes nearly alike.

The caterpillars feed on the oaks, which grow by the sides of woods; and are taken by beating the boughs with a pole, when they with other caterpillars fall into a sheet spread on the ground for that purpose. When full fed, as at (*a*), they are about the size and form of a millipede or wood louse, of an orange brown colour. They change into chrysalis, by fastening themselves at the tail and round the middle, like the last mentioned species. This happens about the beginning of June; and the butterfly appears in about twenty-one days.

The caterpillar at (*f*) is represented as one which having been pierced by the ichneumon, the maggots are making their way out through its skin, after which they spin themselves up in white cases, as at (*h*), and after a few days they appear in the winged state.

Expansion of the wings  $1\frac{1}{4}$ — $1\frac{1}{2}$  inches.

This handsome little butterfly is very common in the southern parts of the kingdom, but is rarely found so far north as Scotland. There has been a general misapprehension entertained as to the sexes of the species, the individuals with the large bright purple patch on the wings having by almost all writers (including Harris) been regarded as the males. Dr. Horsfield, however, by an anatomical investigation

of these tribes, has been led to consider them as females; and those with the dull suffused purple wings as the males. In this respect therefore this butterfly offers a remarkable exception to the rule, that male insects are much more brilliant in their colours than the females. In the Magazine of Natural History, (No. 32), an instance is given of this insect having gone underground to pass the pupa state.

#### HYLOPHILA PRASINANA. THE GREEN SILVER LINES MOTH.

Plate X. fig. *i*—*m*.

SYNONYMS. *Phalaena (Tortrix) Prasinana*, *Wien, Verz. Hubner. Linn. Syst. Nat. ii. 875. Albin's Ins. t. 31. Réaumur Mem. 1. t. 39. f. 13. 14. Wilkes Eng. Moths, &c. t. 1. a. pl. 13.*  
*Pyralis Fagana, Fabricius, Stewart, Stephens (Cat. Chloephora f.) Haworth (Tortrix f.)*  
*Donovan Brit. Ins. 8. pl. 280. (Phalaena f.)*  
*Hylophila Fagana, Hubner.*  
*Halias Prasinana, Treitschke, Curtis. Stephens Illustr. (Hylophila pr.)*  
*Pyralis Sylvana, Fabricius ♂.*

*Upper Side.* The antennæ are red, and like fine threads. The thorax is of a light green, the abdomen nearly white. The superior wings are of a pea green, having three white lines, of a pearly gloss, which cross the wings obliquely. The inferior wings are of a greenish white.

The *under side* is also of a greenish white, the legs are red. The male is seen flying at (*l*), and the female at (*m*).

The caterpillar, seen at (*i*), feeds on the oak, and adheres very strongly to the leaves and branches: when full fed it spins a strong case, in form not unlike the bottom of some boats; wherein it changes to a flesh-coloured chrysalis, shaded on the back with purple. The moth appears the latter end of May.

Expansion of the wings one inch and a quarter.

#### TORTRIX VIRIDANA. THE PEA GREEN MOTH.

Plate X. fig. 1—2. *y*—*z*.

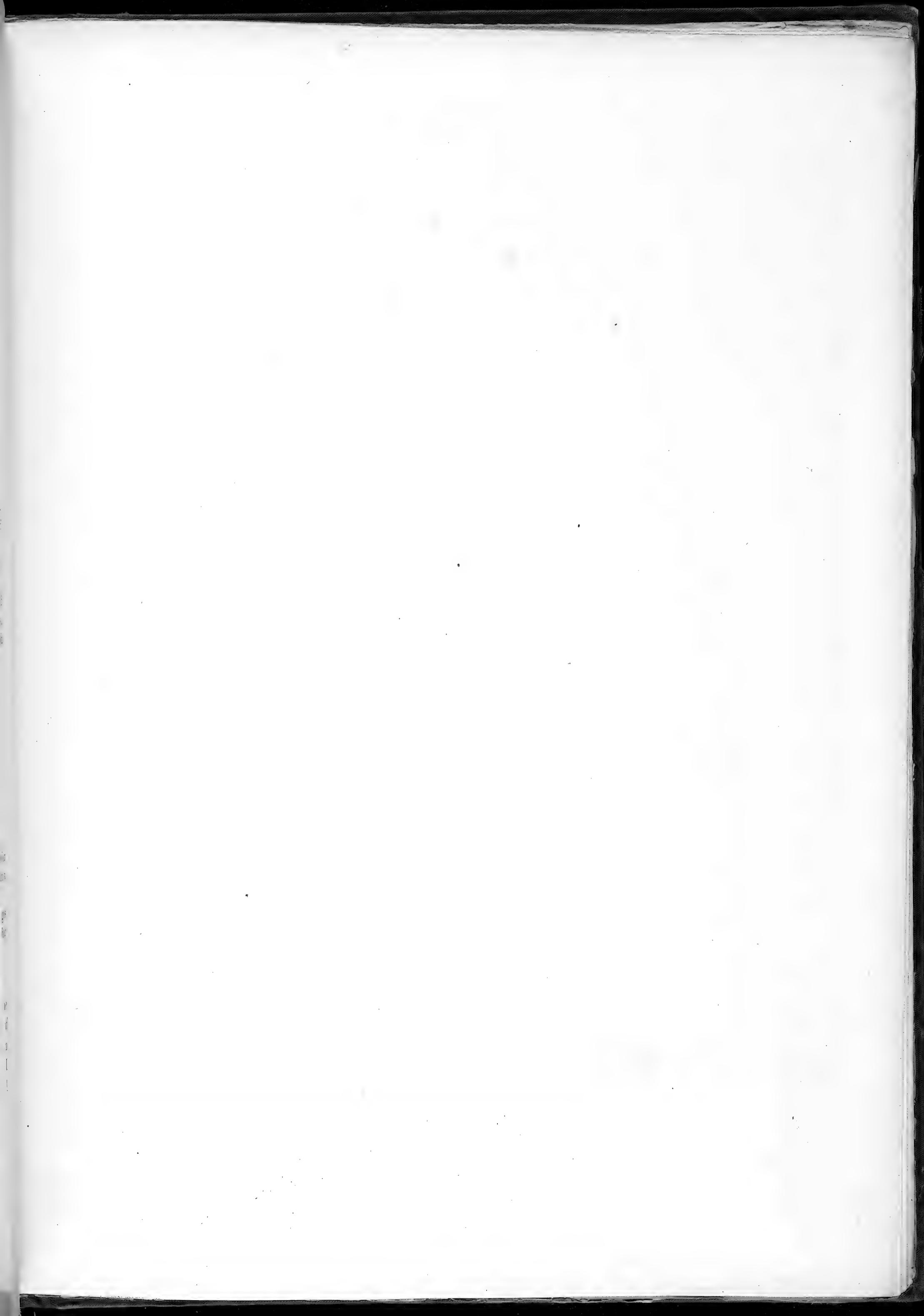
SYNONYMS. *Phalaena (Tortrix) Viridana, Linn. Syst. Nat. ii. p. 875. Albin's Ins. pl. 72. fig. e—h.*  
*Donovan Brit. Ins. 4. pl. 144.*  
*Tortrix Viridana, Stephens.*

*Upper Side.* The antennæ are like fine threads: the thorax is green, as are the superior wings. The inferior wings are of a dingy colour; as is the abdomen. It is shewn at (1), in a sitting position; and at (2), as flying.

The caterpillar is green, as at (*y*), and feeds spun up in the leaves of oak; wherein it changes to the chrysalis about the beginning of June; and the moth appears about the latter end of that month.

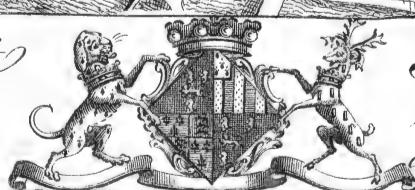
Expansion of the wings three-quarters of an inch.

This little pretty insect is often extremely injurious in oak plantations, from the almost complete defoliation of the trees effected by its innumerable hosts. Some of the great oak woods in the neighbourhood of London are, in certain seasons, even completely laid bare by this insect, and often on beating the branches of this tree, I have dislodged complete swarms of the moth. Instances of its ravages are recorded





To the R<sup>t</sup> Hon<sup>ble</sup> Lady Charlott  
This Plate is most humbly Dedicated



Townshend Baroneſſ Ferrers  
by her Ladyships most oblig'd & fauſtful Serv<sup>ts</sup>  
Mosech Harris J. Grec

by Gilbert White in his Natural History of Selborne, under the name of *Phalæna Quercus*, by Sir W. Jardine in his edition of that work ; and in the 29th, 30th, and 42nd numbers of the Magazine of Natural History.

### COSMIA TRAPETZINA. THE DUN BAR MOTH.

Plate X. fig. *n*—*r*.

SYNONYMS. *Phalæna* (Noct.) *Trapetzina*, *Linn. Syst. Nat.* ii 836. *Hubner. Haworth.*  
*Cosmia Trapetzina*, *Ochsenheimer. Treitschke. Curtis. Stephens.*

*Upper Side.* The antennæ are like fine threads. The head, thorax, abdomen, and wings are of a light brown, or dun colour ; having a few darkish bars or stripes crossing the superior wings, but they differ very much in colour ; some individuals of this species being very dark.

The *under side* is of a pale brown.

The caterpillar at (*n*) feeds on oak ; is of a light transparent green colour ; having a line of light yellow along each side : it spins up among the oak leaves ; and changes to a red chrysalis, covered with a fine bloom, as at (*o*), about the end of June ; and the moth appears in July. The upper side of the moth is shewn at (*r*), and its under side at (*q*).

Expansion of the wings one inch and a quarter.

### ODONTOPOERA BIDENTATA. THE SCOLLOP WINGED BROAD BAR MOTH.

Plate X. fig. *s*—*x*.

SYNONYMS. *Phalæna* (Geom.) *Bidentata*, *Linn. Faun. Suec.* 1255. *Albin's Ins.* pl. 96. fig. *a*—*c*.  
*Phal. (Geom.) Dentaria*, *Fabricius. Hubner.*  
*Odontopera Bidentata*, *Stephens.*

*Upper Side.* The antennæ are like fine threads. The superior wings, which are scolloped, are of a dirty brown, having a broad darkish bar across the middle of each ; in the centre of which there is a mark like the letter O. The inferior wings are somewhat paler than the superior ; they are also scolloped, and appear somewhat darker toward the thorax. The upper side is seen at (*w*), and the under side at (*x*).

The caterpillar is of the looper kind, of a dark brown colour, having several protuberances, variously situated, as individuals are apt to differ in this respect. It changes into chrysalis, seen at (*u*), in the earth, in a strong case, as at (*t*), about the middle of October, and the moth appears the beginning of May.

Expansion of the wings one inch and three-quarters.

### CYNTHIA CARDUI. THE PAINTED LADY BUTTERFLY.

Plate XI. fig. *a*—*f*.

SYNONYMS. *Papilio* (Nymph. Gemm.) *Cardui*, *Linn. Syst. Nat.* ii. 774. *Lewin Pap.* pl. 6. *Donovan Brit. Ins.* 9. pl. 292.  
*Vanessa Cardui*, *Leach. Jermyn. Curtis.*  
*Cynthia Cardui*, *Fabricius. Stephens.* *Duncan Brit. Butt.* pl. 19. fig. 2.  
*Papilio Bella Donna*, *Painted Lady*, *Petiver Pap.* pl. 4. f. 21, 22. *Albin's Ins.* pl. 56.  
*Wilkes Eng. Moths and Butt.* pl. 107. f. 1.

*Upper Side.* The wings are of an orange colour, clouded with black ; particularly the tips, which are covered with a cloud of the same colour, in which is placed five white spots. The

under side of the superior wings is of a fine pink or rose colour, clouded with black; something similar to the upper side. The inferior wings are of a buff colour, handsomely clouded with brown spots, many of which are triangular. The fan edges are beautified with four or five eye-like spots. The upper side of the female is shewn at (f), and the male is seen at (c), shewing the under side.

The caterpillars feed on the thistle and burdock, under a fine web, as represented at (c): they are of various colours; some being darker than others, as at (a). They change into the chrysalis state, hanging by the tail, as at (d) and (b), about the end of July; and the fly appears in about three weeks. The male chrysalis is embellished with gold, and the female appears as ornamented with silver.

Expansion of the wings  $2\frac{1}{3}$ — $2\frac{3}{4}$  inches.

The caterpillars of this species are not gregarious, like those of the majority of the genus *Vanessa*, but feed solitarily on the nettle, mallow, &c. as well as the plants mentioned above. The perfect insect, as more especially noticed under *Colias Electra*, is one of those whose periodical appearance is very irregular, occasionally appearing in great profusion, and even breeding in the metropolis itself.

Like other nearly allied insects it passes the winter in the winged state, and appears again when revived by the warmth of the following spring.

The author of the "Journal of a Naturalist," mentions some interesting instances of its irregular appearance, owing to causes infinitely beyond the comprehension of the entomologist, seeming to require a succession and variety of seasons, and their change, and then springing into life we know not how. This was particularly obvious in the summer of 1815, and the two following, which were almost unceasingly cold and rainy, scarcely a moth or butterfly appeared; and in the early part of 1818, the season was not less ungenial; a few half-animated creatures alone struggled into being; yet this "Painted Lady" was fostered into life and became the commonest butterfly of the year. Some years ago, he also notices, that a quantity of earth was raised in cutting a canal, and in the ensuing summer, on the herbage that sprung up from this new soil on the bank, this butterfly was found in abundance, where it had not been observed for many years before.

This sudden appearance in vast numbers of this butterfly is followed occasionally by their migrating in swarms: thus an immense swarm of this species of butterfly forming a column from ten to fifteen feet broad, was observed in the district of Grandson, Canton de Vaud, in 1828. They traversed the country with great rapidity, from north to south, all flying onwards, low, equally and closely together, and not turning from their course on the approach of other objects. This fact, in connexion with the solitary habits of the larvæ, is remarkable. Professor Bonelli of Turin, also observed a similar flight of the same species in the end of the March preceding their appearance at Grandson. Their flight was directed from south to north, and their numbers were immense. At night the flowers were literally covered with them. Towards the 29th of March their numbers diminished, but even in June a few still continued. They had been traced from Coni, Raconni, Susa, &c. A similar flight of butterflies is recorded at the end of the last century, by M. Loche in the *Memoirs of the Academy of Turin.* (*Mag. Nat. Hist. No. 4.*)

A correspondent of the *Entomological Magazine*, vol. ii. p. 114. states, that on

the 8th of October, 1833, the numbers of this butterfly, in the neighbourhood of Tooting, surpassed every thing of the kind he ever witnessed. The Dahlia appearing to be their favourite plant he was led to suspect that those insects must have migrated from some other part of the country for provisions, up to that day he had not seen a single specimen in the neighbourhood, and but a very few afterwards, and it was evident that they must have been "winging their way" for some time, as most of them were in a faded condition. The same circumstances are more strongly confirmed in a communication by Mr. E. Blyth to the Field Naturalist (vol. i. p. 470.), who asserts that, "for a single day the species appeared every where in abundance, and the day after not one was anywhere to be seen." It is evidently owing to this migratory disposition that the species is so widely distributed, in respect to its geographical range, being found in America, the two extremes of Africa and in Java.

HIPPARCHIA GALATHEA. THE MAMMORESS (OR MARBLED WHITE)  
BUTTERFLY.

Plate XI. fig. *g*—*k*.

SYNONYMS. *Papilio* (Nymph. Gemm.) *Galathea*, *Linn. Syst. Nat.* ii. p. 772. *Lewin Papil.* pl. 28.  
*Donovan Brit. Ins.* vol. 8. pl. 258. ♂. *Wilkes Eng. Moths & Butt.* pl. 100.  
*Hipparchia Galathea*, *Leach, Stephens, Curtis. Duncan Brit. Butt.* pl. 23. fig. 1.  
*Papilio Leucomelanos*, *Our Half-mourner, Petiv. Pap.* pl. 2. f. 10.

*Upper Side.* All the wings are white, beautifully checkered with angulated black spots. In the fourth fan membrane, near the apex of the superior wing, is a circular spot or ring like the eye of a bird, common to the genus. The eggs, which fall loose from the female among the grass, are of a yellowish hue, when first laid; but change presently after to a clear white.

The caterpillar feeds on grass; lives through the winter, and becomes full fed the beginning of June, and appears as at (*h*); and the fly appears at the expiration of twenty days. The male is seen at (*k*), shewing the upper side, and the female at (*i*): she differs from the male in the inferior wings; the under sides of which are of a tawny or orange colour, as if scorched.

Expansion of the wings 2—2½ inches.

This elegant butterfly is not uncommon in the woods, as well as in bogs and moist glades, in various parts of the country. It is however exceedingly local and by no means regular in its appearing, intervals of ten or twelve years having been observed to occur when none would be found, and in the following season it would be a prevailing species. (*Journal of a Naturalist*, p. 284.) There are a great number of species, or at least reputed such, of these Leucomelaniens, as they have been termed on the Continent; and some singular supposed varieties of this species having been figured and described in English works (*Steph. Illustr. Haust*, 1. p. 57. and *Bree in Loudon's Mag. of Nat. Hist.* v. 335.), it is not improbable that we may in reality possess more than one of the species.

## ABRAXAS GROSSULARIATA. THE LARGE MAGPIE MOTH.

Plate XII. fig. *f*—*h*.

SYNONYMS. *Phalæna* (Geom.) *Grossulariata*, *Linn. Syst. Nat.* ii. 867. *Donovan Brit. Ins.* 1. pl. 4.  
*Albin's Ins.* pl. 43. *f.* 71. *d*—*g.* *Wilkes Eng. Moths*, pl. 85.  
*Abraxas Grossulariata*, *Leach, Curtis, Stephens.* *Duncan Brit. Moths*, pl. 23. *f.* 1. 23.

*Upper Side.* The eyes and antennæ are black. The thorax and abdomen are yellow, and spotted with black. The wings are white, covered with round black spots; a double row crossing each superior wing, with a yellow line running between.

The *under side* is similar to the upper. The female moth is seen at (*h*), the male at (*i*), with its wings closed.

The caterpillars feed on the currant bush, and remain during the winter: about the beginning of June they are full fed, as we usually term it, and then appear as at (*f*): they spin a slight web, in which they change to a black chrysalis; ringed, or encircled with yellow rings: the moth appears in twenty-one days after.

Expansion of the wings two inches.

This is one of the commonest, and at the same time handsomest British species of Moths. It is extremely variable in its markings, in some specimens the black being predominant, and in others being entirely or almost obliterated. One of the latter I have represented in the frontispiece to my Entomologist's Text Book, from a specimen captured by Mr. Gray of Dudley.

## VANESSA ANTIOPA. THE CAMBERWELL BEAUTY BUTTERFLY, OR GRAND SURPRISE.

Plate XII. fig. *a*—*e*.

SYNONYMS. *Papilio* (Nymph. *Phal.*) *Antiopa*, *Linn. Syst. Nat.* ii. p. 776. *Lewin Pap.* pl. 1. *Donov. Brit. Ins.* 3. pl. 89.  
*Vanessa Antiopa*, *Ochsenheimer, Leach, Stephens.* *Duncan Brit. Butt.* pl. 18. *f.* 2.  
*Vanessa Antiope*, *Curtis Brit. Ent.* pl. 96.  
*The Willow Butterfly, Pap. Antiopa*, *Wilkes Brit. Ins. and Butt.* pl. 113.

*Upper Side.* The antennæ, eyes, thorax, and abdomen are of a very dark brown, almost black. The superior wings are of a fine chocolate colour: on the sector edge are two spots of white, placed near the apex. The inferior wings are also of a fine chocolate: the fan edges of all the wings are angulated, having a broad border of light yellow; within which is a row of blue oval spots, one on each membrane.

The *under side* is black, having a broad border of pale buff colour, as seen at (*e*).

The caterpillar feeds on the willow, and is always found on the highest branches: its manner of feeding, time of change, and all other parts of its history, are exactly similar to that of the peacock; so that I think it will be quite unnecessary to say any thing further.

The upper side of the fly is seen at (*d*), and the under at (*e*). The caterpillar is shewn, as full fed, at (*a*); at which time it is garnished with short grey hair, the prickles are black. It changes to the chrysalis hanging by the tail, as represented at (*b*); and in about a day's time the chrysalis appears, as shewn at (*c.*) The fly appears exactly at the same time as the peacock.

Expansion of the wings  $2\frac{3}{4}$ — $3\frac{1}{6}$  inches.



To the Right Honourable  
This Plate is most humbly Dedicated



Countess of Dalkeith -  
by her Ladyships most Obliged & Obedient Servt  
Moses Harris







To the Right Honourable,  
This Plate is most humbly Dedicated



Countess of Ailesford  
by her Ladyship's most obliged & obedient Serv<sup>t</sup>  
Moses Harris

As more especially noticed under *Colias Electra* (pl. 29. fig. *m—o.*), this insect is very inconstant in its appearance, since, although generally extremely rare, instances are on record when, as about seventy years ago, it appeared in such immense numbers as to attract public attention, and to obtain for the insect the name of the Grand Surprise. Its ordinary English name, the Camberwell Beauty, has been given to it in consequence of its having been first observed at Camberwell. It has since been taken at Battersea, and other low places on the banks of the Thames (probably attracted by the willows on which its larvæ feed), as well as in various parts of England. Like others of this genus it survives the winter, and again appears in the following spring. The mode in which the suspension of the chrysalis of this and other species of this genus is effected, has been carefully investigated by Réaumur and De Geer, whose figures are copied into the 'Insect transformations.'

#### BOMBYX MORI. THE SILK MOTH.

Plate XIII. fig. *a—f.*

SYNONYMS. *Phalæna (Bombyx) Mori.* *Linn. Syst. Nat.* ii. 817. *Stewart. Albin's Ins.* pl. 12. f. 16.  
*Bombyx Mori, Stephens.*

*Upper Side.* The caterpillars are produced from eggs of the shape, colour, and size of those at (*a*), about the beginning of May, or sometimes sooner; and if the mulberry leaves are not put forth, the young caterpillars may be fed with lettuce. They are naturally tender, and subject to several diseases, to prevent which they must be kept very clean and dry, often moving them, and for the sake of air perfuming the room where they are kept with incense. When full fed, as at (*b*), they spin themselves up, each in a yellow silken case or cocoon, as at (*c*), and change into the chrysalis, which is figured at (*d*): this happens about the middle of June. In this state they remain about twenty days, when the moths appear: they are of a pale buff colour, having two faint lines crossing the wings, which are a little bent, or hooked at the tips or apices. I have figured the male at (*e*), and the female at (*f*), where they are shewn as in coitu.

Expansion of the wings one inch and a half.

The silk worm is, perhaps, the most interesting insect with which mankind is acquainted, not only on account of the great value of the material of which its cocoon is formed, but also of the means of employment it affords to thousands of artisans. The insect is a native of the northern provinces of China, although now perfectly naturalised in other countries, and the Chinese are supposed to have discovered the art of silk making 2700 years B.C. From China the art passed to Persia, India, Arabia, and the whole of Asia. The expedition of Alexander the Great into Persia and India, first introduced the knowledge of silk to the Grecians, 350 years B.C., and with the increase of wealth and luxury in the Grecian court the demand for silk also prodigiously augmented. Thence it passed to Rome, the Emperor Heliogabalus being the first who wore a robe entirely of silk. The real nature of the material however remained unknown, by some it was supposed to be a kind of fleece which grew upon the branches of trees, by others the bark of the tree itself, by some as the production of a flower, by others as the production of a shell-fish similar to a mussel, whilst others maintained still more ridiculous notions. About

the beginning of the sixth century however the monks under the persuasion of the Emperor Justinian contrived to bring some eggs secreted in the handles of their staves from China, which being hatched and the caterpillars carefully fed, the experiment proved fully successful, and by degrees the silk-worm became generally cultivated throughout Greece. Charles VII. first introduced the mulberry into France from upper Italy, and in 1480 silk manufactories were established at Tours. Henri Quatre greatly exerted himself to extend the silk trade in his kingdom, and by degrees it has so much increased as to become one of the principal branches of French commerce.

Up to the beginning of the sixteenth century silk was scarcely known in England; the first pair of silk stockings ever seen in the kingdom having been received by Henry VIII. from Spain. Queen Elizabeth and James I. especially cultivated this branch of manufacture, from which period to the present it has gradually increased, so that at the present period it has been calculated that not fewer than 700,000 persons are engaged in it, and that in the year 1833 the quantity of silk imported for home consumption was more than four millions and a half pounds weight

The eggs of this insect when good, are of a pale slate or dark lilac colour, they may be purchased in Covent Garden market at 10s. per ounce. Those of a pale yellow colour are imperfect. The caterpillars are very voracious. The Count Dandolo, who has published a valuable work on this insect, gives the following as the result of the most exact calculations made from the observations of the cultivators of silk, who know the exact weight of the leaves devoured by the caterpillars.

1609 $\frac{1}{2}$  pounds weight of leaves are consumed by the progeny raised from an ounce weight of eggs; of these,

In the first age . . .	{ 6 lbs. of sorted leaves are given to the insect, out of which	} 1 $\frac{1}{2}$ lbs. are wasted as refuse
second age 18 . . . . .		
third age . 60 . . . . .	9	“ “
fourth age 180 . . . . .	27	“ “
fifth age 1098 . . . . .	102	“ “
		105 allowed for evaporation
	1362	+
Deduct further al- lowance for litter, } 155 $\frac{1}{2}$		247 $\frac{1}{2}$ = 1609 $\frac{1}{2}$ lbs.
uneaten leaves, &c.		

1206 $\frac{1}{2}$  lbs. actually devoured, of which 745 lbs. are deposited as excrement in an undigested state.

The several ages above mentioned are the periods which intervene between the several moultings to which the silk-worm is subject.

The cocoon consists of three distinct layers of silk, the first is loose and flossy, and is unserviceable for the silk manufacture; the second is closer, the silk crossing from side to side; and the third is still finer, being glued strongly together so as to form a compact inner coating. Of course the more silk which is employed in the





To the R<sup>t</sup> Hon<sup>ble</sup> Lord Wentworth,  
this Plate is most humbly Dedicated  
by his Lordships most Obliged  
and Obedient Servant Moses Harris.

construction of the outer floss covering, the inner coatings are diminished in thickness, and upon this principle M. Hoffman of Munich, has succeeded in obtaining considerably more than the ordinary supply of the middle layer, by placing the worms when full grown in very confined situations, their instinct informing them that in such case there is no necessity for a floss coating of the ordinary thickness.

The thread is continuous: its length in a cocoon varying from six hundred to a thousand feet, and the whole does not weigh more than three grains and a half; ten thousand cocoons scarcely averaging so much as five pounds weight. An ounce of eggs will produce about forty thousand caterpillars, which will produce from 80 to 100 lbs. of cocoons, or about 8 lbs. of raw silk.

#### ARCTIA CAJA. THE LARGE TYGER MOTH.

Plate XIII. fig. *g*—*m*.

SYNONYMS. *Phalæna* (Bomb.) *Caja*, *Linn. Syst. Nat.* ii. p. 819. *Donovan Brit. Ins.* 1. pl. 15. *Albin's Ins.* pl. 20. *Wilkes Eng. Moths*, pl. 36.  
*Eyprepia Caja*, *Ochsenheimer*, *Curtis*.  
*Arctia Caja*, *Schrantz*, *Latreille*, *Stephens*.  
*Chelonia Caja*, *Godart*.

*Upper Side.* The antennæ are finely pectinated, those of the male being largest. The thorax is dark brown. The superior wings are of a cream colour, having a number of large cloud-like spots of a deep brown colour. The abdomen and inferior wings are scarlet, fringed with yellow. The former having a black stroke on every annulus. The latter are spotted with black, each spot being about the size of a tare. The female is shewn at (*k*), and the male as setting at (*l*).

The caterpillar when full fed appears as shewn at (*h*), and changes to a black chrysalis, seen at (*i*), in a grey web; and the moth appears the end of June. The eggs are of a fine green colour, and are laid in a very regular and curious order, like a pavement.

Expansion of the wings  $2\frac{2}{3}$ —3 inches.

This is one of the commonest, and at the same time most brilliantly coloured, of our moths. The caterpillars which appear to be omnivorous, have obtained the name of woolly bears, from their dense coating of hairs, and the same character has been employed in the formation of the modern generic name of the moth, *Arctia*.

#### ORGYIA GONOSTIGMA. THE SCARCE VAPOURER MOTH.

Plate XIV. fig. *a*—*g*.

SYNONYMS. *Phalæna* (Bombyx) *Gonostigma*, *Linn. Syst. Nat.* ii. 826. *Donovan Brit. Ins.* vol. 9.  
pl. 316. *Albin's Ins.* pl. 90. fig. *a*—*d*. *Wilkes Eng. Moths*, pl. 65.  
*Orgyia Gonostigma*, *Ochsenheimer*, *Stephens*. *Curtis Brit. Ent.* pl. 378.

*Upper Side.* The antennæ are dark brown, and pectinated. The thorax and abdomen are also brown. The superior wings are of a fine brown, having a number of fine blueish lines near the shoulder, and a spot of orange colour near the lower corner of the wing. The inferior are of the same dark brown. I have shewn the male at (*d*). The female hath no wings, but appears motionless, like a lifeless lump, as at (*f*).

The caterpillar feeds on oak and hazel, and may be found full fed, as at (b) and (e), the latter end of May: it changes to a chrysalis within a spinning; and the moth (if a male) is produced in eighteen days after; the female lays in chrysalis but seven days. The male has the faculty of smelling the female at a very great distance; some scruple not to say half a mile; however it is most certain they do smell them a great way: and I believe the Lepidoptera in general have the same faculty in a greater or less degree, more especially those phalenæ whose females are without wings. I have shewn the chrysalis of the male at (e). There are two broods of this moth in summer, the latter appearing in September; the caterpillars of which may be found full fed in August, and the eggs, which are like small beads, lay during the winter; and for to keep them from the inclemency of which, the female covers them with a fine hair or down.

Expansion of the wings  $1\frac{1}{8}$ — $1\frac{1}{2}$  inches.

#### STROPHOSOMUS CORYLI. THE NUT BEETLE.

Plate XIV. fig. *h*—*m*.

SYNONYMS. *Cureulio Coryli*, *Fabricius Syst. Eleuth.* ii. 524. *Panzer Fauna Ins. Germ.* 19. fig. 12.

*Martyn Coleop.* pl. 19. fig. 20.

*Strophosomus Coryli*, *Schonherr*, *Stephens*.

The caterpillar of this beetle is produced from a small brown egg, fixed by the parent to the hazel nut when the nut is very soft and tender. The caterpillar when hatched from the egg eats through the shell immediately into the nut, without spoiling the outward form of the egg, which still covers the hole or puncture; but when it is grown pretty large, it begins to open the hole, making it very round and smooth: this serves to give air, and throw out part of its dung when it wants room: by the time the nut is full ripe, and falls to the ground, the caterpillar is full fed, and working itself through the hole, (which is done with seeming difficulty) it goes into the mould, and changes to the nympha. The beetle appears the beginning of May following. I have given a drawing of the nut at (m), with the hole as it is usually made by the caterpillar. At (h) the nut is as broke open, and the caterpillar discovered within; which is shewn again at (i) in full proportion. The nympha is seen at (k), and the beetle which it produces is exactly figured at (l).

Length of the body (including the rostrum) half an inch.

The common Nut Weevil is the larva of another of the Curculionidæ, namely, the *Balaninus Nucum*, distinguished from the present by the much greater length of its rostrum. Its history is represented by Rosel, whose figures have been copied into most of our popular works on the natural history of insects. The female of this species pierces the young nut with her rostrum, and then deposit san egg *within* the fruit; and the grub only makes an orifice in the shell when ready to become a pupa.

#### HYBERNIA DEFOLIARIA. THE MOTTLED UMBER MOTH.

Plate XIV. fig. *n*—*r*.

SYNONYMS. *Phalæna (Geometra) defoliaria*, *Linn. Syst. Nat.* ii. p. 285. *Hubner*, *Haworth*, *Albin's*

*Ins.* pl. 100. fig. *e*—*h*. *Wilkes Eng. Moths*, pl. 72.

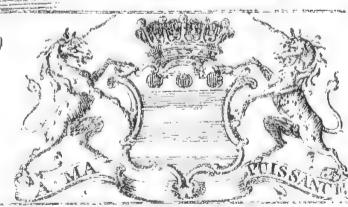
*Hybernia defoliaria*, *Latreille*, *Stephens*. *Curtis Brit. Ent.* pl. 703.

*Upper Side.* The antennæ are a little pectinated, but very fine and hair-like. The thorax and abdomen are of a lightish or pleasant brown. The superior wings are of a light orange, freckled over with short brown strokes, and having two brown bars crossing each, of an unequal breadth. The inferior wings are of the same colour with the upper; but have no bars or lines





To the Right Honourable  
This plate is humbly Dedicated by her



Countess of Stamford  
Ladyship, most Obedient & Faithful Servt  
Moses Hart

crossing them. This is but a general description ; for these moths vary much from each other in their colourings and marks.

The eggs are laid in regular order on the oak, hazel, and black-thorn, on which the caterpillars feed. They are full fed, as at (n) and (o), the latter end of May ; when they go into the earth and change into chrysalis, seen at (p) ; and the moth appears in October. The moth is shewn at (q) and (r). The female has no wings.

Expansion of the wings two inches.

#### DASYCHIRA PUDIBUNDA. THE YELLOW TUSSOCK MOTH.

Plate XV. fig. major.

SYNONYMS. *Phalæna* (Bom.) *Pudibunda*, *Linn. Syst. Nat.* ii. 824. *Donov. Brit. Ins.* vol. 5. pl. 160.  
*Albin's Ins.* pl. 26. f. 38. *a—d.* *Wilkes' Moths*, pl. 63.  
*Dasychira pudibunda*, *Stephens*.  
*Laria pudibunda*, *Schränk*, *Leach*.

*Upper Side.* The antennæ are pectinated. The whole body and wings are of a dirty buff colour. The superior wings have some darkish bars crossing them ; some of which are undulated. The inferior wings have a small cloud near the abdominal corner : see *fig. c.* which shews the male : the female is shewn at (f).

The caterpillars feed on several sorts of fruit trees ; and are full fed about the end of September, and the moths appear the middle of May. The caterpillar producing the female moth is seen at (d) ; the chrysalis at (e) ; the caterpillar of the male is shewn at (a), and its chrysalis at (b).

Expansion of the wings  $1\frac{2}{3}$ — $2\frac{1}{2}$  inches.

#### ACRONYCTA PSI. THE GREY DAGGER MOTH.

Pl. XV. fig. sup. dext. and inf. sinistr.

SYNONYMS. *Phalæna* (Noct.) *Psi*, *Linn. Syst. Nat.* ii. p. 846. *Donovan Brit. Ins.* 4. pl. 133.  
*Albin's Ins.* pl. 86. fig. f. *Wilkes' Eng. Moths*, pl. 60.  
*Acronycta Psi*, *Ochsenheimer*, *Treitschke*, *Curtis*, *Stephens*.

*Upper Side.* The antennæ are like threads. The thorax is crested, and of a dark grey colour. The abdomen and wings are also of a greyish colour ; having many marks on them, representing daggers.

The caterpillar feeds on willow, and most sorts of fruit trees ; and becomes full fed the end of August, and then it appears as at (h). It changes to a reddish chrysalis, seen at (i), in a strong web ; and the moths appear in May following. The female is seen at (k), and the male at (l).

Expansion of the wings one inch and a quarter.

#### MELANIPPE HASTATA. THE ARGENT AND SABLE, OR MOTTLED BEAUTY MOTH.

Plate XV. fig. med. dextr.

SYNONYMS. *Phalæna* (Geom.) *Hastata*, *Linn. Syst. Nat.* ii. 870. *Donovan Brit. Ins.* 4. pl. 129. f. 1. 2. 3.  
*Zerene Hastata*, *Treitschke*, *Curtis*.  
*Melanippe Hastata*, *Duponchel*, *Stephens*. *Duncan Brit. Moths*, pl. 28. f. 3.

*Upper Side.* The antennæ are like threads. The head, thorax, and abdomen are white spotted with black. The wings are of a clear white, checkered with angulated spots of a fine black. I have shewn the upper side of the figure at (m). The under side is like the upper, but much fainter. They are extremely scarce ; few having them in their possession. They are taken about the sixth of June, in lanes, which lead through woods, hedged with white-thorn.

Expansion of the wings one inch and a half.

#### MELITÆA CINXIA. THE GLANVILLE FRITILLARY BUTTERFLY.

Plate XVI. fig. a—f.

SYNONYMS. *Papilio* (Nymph. Phal.) *Cinxia*, *Linn. Syst. Nat.* ii. 784. *Lewin's Papil.* pl. 14.

*Donov. Brit. Ins.* vol. vii. pl. 242. f. 1. *Wilkes' Eng. Moths, &c.* pl. 111.

*Melitæa Cinxia*, *Ochsenheimer*, *Leach*, *Stephens*.

*Papilio Delia*, *Hubner*.

*Papilio Pilosellæ*, *Esper Schmett*, 1. pl. 47. f. 3. pl. c. f. 4.

*Upper Side.* The antennæ are of a dark brown, as are the head, thorax, and abdomen. All the wings are of a yellow orange colour, striped and spotted with black.

The *under side* of the superior wings are of a pale orange, but yellow at the apices ; having some few markings of dark brown. The inferior wings are of a pale yellow, having a number of brown arch-like spots, which lie in rows. The fan edge is bordered with spots, and appears something like ermine. See the *under side* at (f). The female is shewn at (d), and the male at (e).

The caterpillars, represented at (a), feed on the long-leaved plantain : they are in this state during the winter, and are full fed the latter end of April ; when they hang themselves up by the tail, and change into the chrysalis, as shewn at (c) ; and the fly appears in about fourteen days after.

This fly took its name from the ingenious Lady Glanville ; whose memory had like to have suffered for her curiosity. Some relations that were disappointed by her will attempted to set it aside by acts of lunacy ; for they suggested, that none but those who were deprived of their senses would go in pursuit of butterflies. Her relations and legatees cited Sir Hans Sloane and Mr. Ray to support her character : the last gentleman went to Exeter, and on the trial satisfied the judge and jury of the lady's laudable inquiry into the wonderful works of the Creation, and established her will.

Expansion of the wings  $1\frac{3}{4}$ —2 inches.

This insect, which is generally on the wing in June, is very local in its habitats ; Mr. Stephens states the neighbourhood of Ryde and the Sand-rock hotel, Isle of Wight, also at Birch and Darenth woods in Kent, and near Dover, as well as in a wood near Bedford. The caterpillars feed upon the narrow-leaved plantain (*Plantago lanceolata*), the mouse-ear hawk-weed, and the common Germander speedwell (*Veronica chamaedrys*). During the winter they assemble in small societies, and spin a kind of web by fastening a few of the leaves together and covering it with a web of silk.

The figure given as that of this species in the Naturalist's Library, pl. 14. f. 1. 2. represents a variety of *Mel. Artemis*.



To the Right Honourable Lord Carysfort  
 This plate is most humbly Dedicated by his Lordships most Obed. & Obliged Serv.  
 Moses Harris.





NEMEOPHILA PLANTAGINIS. THE SMALL TYGER, OR WOOD TYGER MOTH.

Plate XVI. fig. *g—m.*

SYNONYMS. Phal. (Bomb.) Plantaginis, *Linn. Syst. Nat.* ii. 820. *Donovan Brit. Ins.* 4. pl. 134.  
*Wilkes' Eng. Moths*, pl. 50.  
*Nemeophila Plantaginis*, *Stephens. Duncan Brit. Moths*, pl. 21. 1.

*Upper Side.* The head is black: the thorax is also black, between which is a ring or collar of red. The superior wings are of a dark cream colour, handsomely clouded with large black spots. The inferior wings are of a pale orange, tinged with red, and spotted with black. The abdomen of the male is of a dark yellow, as figured at (*h*); but that of the female is of a bright red, as seen at (*l*).

The caterpillar is found on such banks as are mentioned in the description of the fourth plate, for finding the Cream Spotted Tyger caterpillar; and are seen at the same time. They are full fed at the beginning of May, as at (*g*); when they spin a greyish web, wherein they change to a black chrysalis, covered with bloom, as at (*h*). The moths fly in the woods about four o'clock in the afternoon, and settle in the grass.

Expansion of the wings  $1\frac{1}{2}$ — $1\frac{5}{6}$  inch.

CLISIOCAMPNA NEUSTRIA. THE LACKEY, OR BARRED TREE LACKEY MOTH.

Plate XVII. fig. *a—f.*

SYNONYMS. Phalaena (Bomb.) Neustria. *Linn. Syst. Nat.* ii. p. 818. *Donovan Brit. Ins.* vol. iii.  
pl. 95. *Albin's Ins.* pl. 19. f. 27. *e—l.*  
*Lasiocampa Neustria*, *Schrantz, Leach.*  
*Clisiocampa Neustria*, *Curtis, Stephens.*

*Upper Side.* The antennæ are brown, and pectinated. The head, thorax, and abdomen are brown. The superior wings are of reddish brown; having a dark broad bar crossing the middle. I have shewn the female flying at (*e*); she is paler than the male, which is of a deep fox colour, as described at (*f*).

The caterpillars feed on the briar, white-thorn and black-thorn, and almost all sorts of fruit trees. They proceed from eggs, which are laid round a twig in very beautiful order, and covered with hair. The caterpillars are not hatched till the spring following; when they live sociable, in a web; but before they change, they separate. It is pretty enough to see them as they lie on their web together move their heads all at the same instant of time, as if one soul had animated their little bodies. When full fed, as at (*a*), the caterpillar spins itself up in a double case, the inner one being in the form of an egg; through which it works a fine powder, like flower of brimstone; the use of which I know not. Soon after this it changes into chrysalis, described at (*d*): the moth appears about thirty days after.

Expansion of the wings  $1\frac{1}{4}$ — $1\frac{5}{6}$  inch.

This is one of the most injurious species of insects which we possess; our fruit trees being sometimes completely defoliated by vast numbers of the caterpillars which feed in society.

SPILOSOMA LUBRICEPEDA. THE CREAM-DOT STRIPE, OR SPOTTED BUFF MOTH.

Plate XVII. fig. *g*—*l*.

SYNONYMS. *Phalæna* (*Bombyx*) *Lubricepeda*, *Linn. Syst. Nat.* ii. 829. *Marsham in Linn. Trans.* 1. pl. 1. f. 2. *Donovan Brit. Ins.* pl. 16. pl. 568. *Albin's Ins.* pl. 24. f. 35. *a*—*e*. *Wilkes' Eng. Moths*, pl. 43. *Spilosoma Lubricepeda*, *Stephens, Curtis*.

*Upper Side.* The antennæ are pectinated and black. The thorax is cream colour, spotted with black: the abdomen is orange, spotted with black. The superior wings are also of a cream colour, having a row of black spots reaching from the middle of the slip edge to the apex of the wing; besides a number of other small ones dispersed over the same. The inferior wings are of the same colour, but have not so many black spots. The female is seen at (*h*), and the male at (*l*); the latter is known from the female by the broadness of its antennæ.

The caterpillar feeds on various plants in gardens, particularly the Jerusalem artichoke. They become full fed, as at (*h*), about the middle of August, when they change to a black chrysalis, seen at (*i*), within a spinning; and the moths appear in May following. They are very common, and are found sitting against pales, walls, &c.

Expansion of the wings one inch and a quarter to nearly two inches.

CETONIA AURATA. THE ROSE BEETLE.

Plate XVII. fig. *m*—*q*.

SYNONYMS. *Scarabæus Auratus*, *Linn. Syst. Nat.* ii. 557. *Martyn Col.* pl. 3. f. 27. *Cetonia Aurata*, *Fabricius, Latreille, Leach, Stephens*.

The antennæ are clubbed, the knobs divided into thin scales. The thorax and elytra are of a lovely golden green; the former thinly covered with downy hair: the incisures of the abdomen are white. The tibiae of the hinder legs are dentated on the inner side.

The caterpillars feed under ground, on the roots of plants and shrubs: they proceed from eggs, laid by the female in the earth, where she leaveth them to hatch. The caterpillars are several years before they arrive to their full size, when they appear as at (*a*), of a cream, or rather tallow colour, having a red head. They change to the pupa, seen at (*b*), about March, and the beetle appears in May. The female is seen flying at (*p*), to shew its transparent wings, and at (*o*), with the wings closed. The male is shewn at (*q*): it is redder than the female, and something smaller.

Length of the body three-quarters of an inch.

This is one of our handsomest and commonest beetles, frequenting the blossoms of the rose (on the pollen of which it subsists) as well as other flowers. I have observed it also in the greatest profusion upon the privet when in flower. It flies in the hottest sunshine, wheeling about with its broad membranous wings, its wing-cases being *vertically* elevated over its back.



M<sup>o</sup> Harris ad Vivum

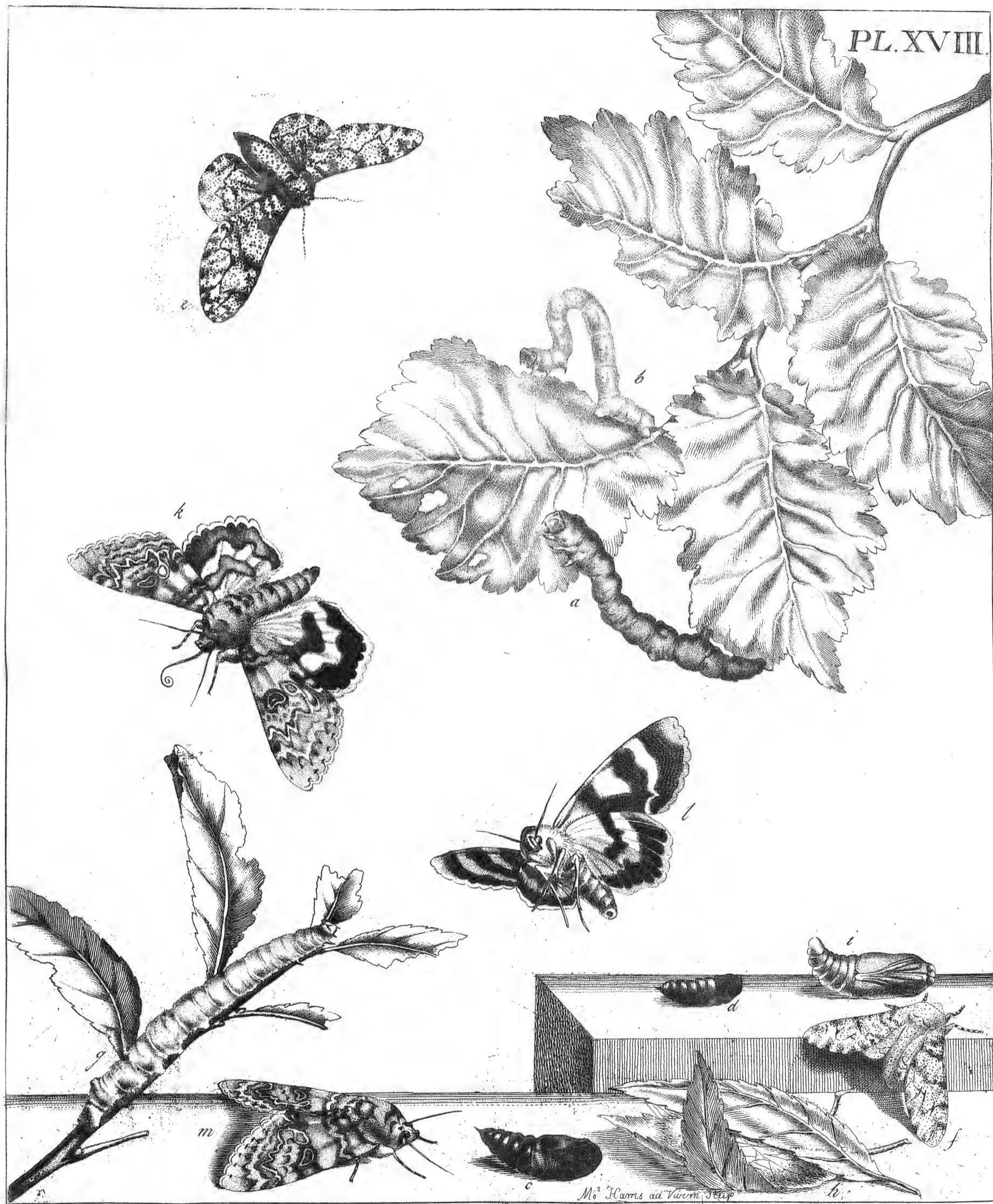
To the Right & I have had the  
most Humbly Dedicated by her Ladyship's  
most Obliged & Obed. Humble Servt.  
M<sup>o</sup> Harris





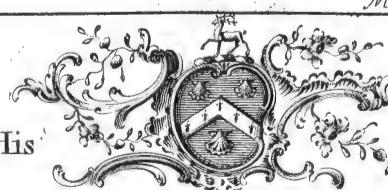


PL. XVIII.



To the Honourable

This Plate is most humbly Dedicated by His



Tho: Townshend.

Obliged & Obedient Servant  
Moses Harris.

## AMPHIDASIS BETULARIUS. THE PEPPERED MOTH.

Plate XVIII. fig. *a*—*f*.

SYNONYMS. *Phalæna* (Geom.) *Betularia*, *Linn. Syst. Nat.* ii. p. 862. *Donovan Brit. Ins.* 7. pl. 237. *Albin's Insects*, pl. 40. fig. 64. pl. 41. fig. 66. pl. 91. fig. *a*—*d*. pl. 92. fig. *a*—*d*. *Wilkes' Eng. Moths*, pl. 77. *Amphidasis Betularius*, *Treitschke, Stephens*. *Biston Betularius*, *Leach*.

*Upper Side.* The antennæ are pectinated. The head, thorax, and abdomen are white, striped and spotted with black. The superior and inferior wings are also white, striped and freckled with black.

The *under side* is similar to the upper; the legs and antennæ are spotted.

The caterpillars feed on oak, elm, &c.: they differ from each other in colour, as well as in exterior form; some being of an hazel, others very dark brown; some have protuberances on the various parts of the body, others have none. They are full fed about the beginning of September, as at (*b*); when they go into the ground, and change into a black shining chrysalis, shewn at (*c*), having a sharp pointed tail; and about the end of May the moths appear. The female is shewn flying at (*e*), and the male at (*f*).

Expansion of the wings two inches and a half.

## CATOCALA NUPTA. THE RED UNDER WING MOTH.

Plate XVIII. fig. *g*—*m*.

SYNONYMS. *Phalæna* (Noct.) *Nupta*, *Linn. Syst. Nat.* ii. p. 841. *Duncan Brit. Ins.* vol. 7. pl. 224. *Albin's Ins.* pl. 80. fig. *a*—*d*. *Wilkes' Eng. Moths*, pl. 35. *Catocala Nupta*, *Ochsenheimer, Curtis, Stephens*. *Duncan Brit. Moths*, pl. 26. fig. 2. *Phalæna* (Noct.) *Pacta*, *Harris, 1st edit.* (sed nec *Linn.*)

*Upper Side.* The antennæ are like threads. The thorax is crested. The abdomen is furnished with tufts of hair, one on each annulus. The body and superior wings are of a dirty grey: the latter having double lines, and undulated bars crossing them in several places, and a remarkable spot on the bar tendon, in the middle of the wing, formed like a human ear; the mark is seen in many other species. The inferior wings are of a fine scarlet, having two broad bands or bars of black. The upper side is seen at (*k*), the under side at (*l*), which differs from the upper side. The body and legs are of a buff colour. The superior wings are of a dirty buff, having three dark clouds crossing each. The inferior wings are red, having two dark bands. This moth has a spiral tongue, and all the wings are dentated.

The caterpillar seen at (*g*), feeds on willow; is about two inches and a half in length; in colour so like the bark, that it is very difficult to see it. It becomes full fed about the beginning of July, when it changes into chrysalis under the bark, within a spinning. The chrysalis is red, covered with a fine bloom, as shewn at (*i*). The moths appear in August, and fly in the day.

Expansion of the wings three inches.

This is the most abundant of all the British species of *Catocalæ*; its large size and varied colours rendering it very conspicuous.

## EUPITHECIA CENTAUREATA. THE LIME SPECK MOTH.

Plate XIX. fig. *a*—*f*.

SYNONYMS. *Geometra Centaureata*, *Wien. Verz.*, *Hubner*, *Haworth*.  
*Eupithecia Centaureata*, *Stephens*, *Curtis*.

*Upper Side.* The antennæ are like fine threads. The thorax and abdomen, which are crested, are of a cream colour, having few or no marks thereon. The wings are also of a cream colour, prettily marked with darkish lines and waved bars.

The *under side* is pale, having few markings. All the wings are round or even edged.

The caterpillar is of the looper kind, as seen at (*a*) and (*b*) : it feeds on the French marigold, and changes to the chrysalis in the mould, the end of August. The part which contains the wings is green, the rest brown, as may be seen at (*e*). The moth appears the end of June following. The female is shewn at (*d*), and the male at (*f*).

Expansion of the wings about one inch.

## CATOCALA PROMISSA. THE CRIMSON UNDERWING MOTH.

Plate XIX. fig. *g*—*l*.

SYNONYMS. *Noctua Promissa*, *Wien. Verz.*, *Fabricius*, *Hubner*.  
*Catocala Promissa*, *Ochsenheimer*, *Curtis*, *Stephens*.  
*Phalæna Nupta*, *Harris*, 1st. edit. *Wilkes' Eng. Moths*, pl. 68. (sed nec *Linn.*)

*Upper Side.* The antennæ are like fine threads or bristles. The thorax and abdomen, which are crested, are of a fine dark brown. The superior wings are also of a fine warm brown, having a variety of shades and dark spots. The inferior wings are of a fine crimson, having two broad bars of black thereon.

The *under side* is lighter; particularly the superior wings. I have shewn this insect flying in three different positions, at (*i*), (*k*), and (*l*).

The caterpillars feed on very high oak trees, from whence they are beaten, into sheets, spread on the ground for that purpose. They are full fed the beginning of June, and appear as at (*g*); they then spin themselves up in webs, against the tree, among the moss; and the moths appear the beginning of July. The chrysalis is shewn as taken out of the web, at (*h*). It is of a dark red colour, covered with a bloom, which removes or comes off with touching.

Expansion of the wings two inches and three-quarters.

## SMERINTHUS TILIÆ. THE LIME HAWK MOTH.

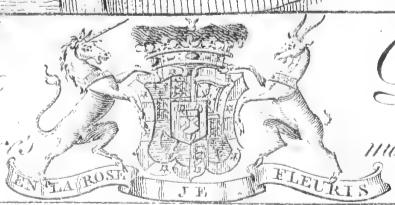
Plate XX. fig. *a*—*g*.

SYNONYMS. *Sphinx Tiliæ*, *Linn. Syst. Nat.* ii 797. *Donovan Brit. Ins.* vol. x. pl. 325. *Albin's Ins.* pl. 10. *Wilkes' Eng. Moths*, pl. 23.  
*Smerinthus Tiliæ*, *Latreille*, *Stephens*, *Curtis*. *Duncan Brit. Moths*, pl. 4. f. 1.

*Upper Side.* The antennæ are a little notched, like a saw, and are thickest in the middle. The thorax is of a dark olive, but light on the sides. The superior wings are angulated, of a light brown in the middle part, in which are placed two spots of a dark olive colour, one of which is rather large, and of a triangular form. The fan edges are of a pleasant olive; the apices are white. The inferior wings of a clay colour: the abdomen is also of an olive colour.

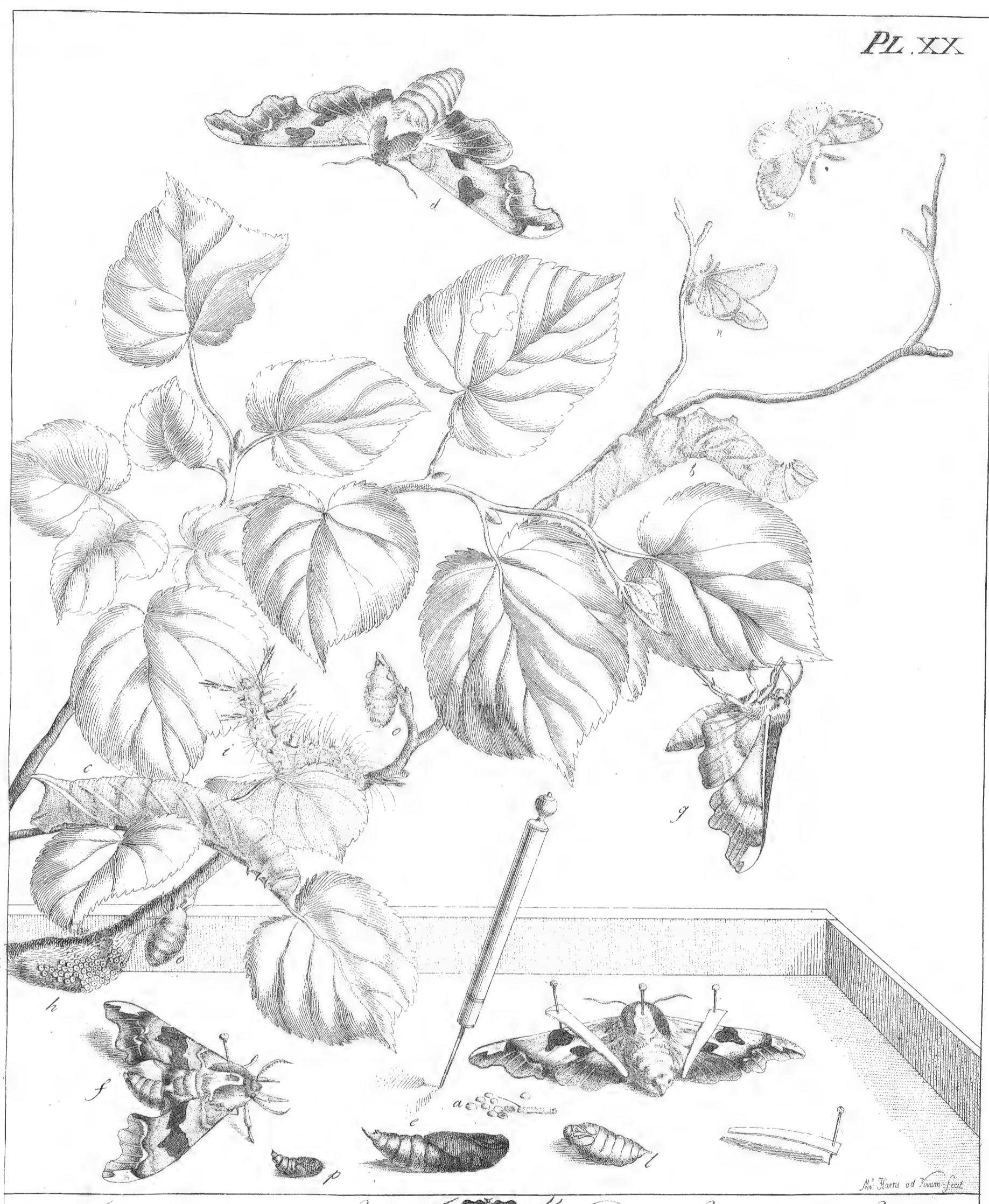
M<sup>o</sup> Harris ad 76

To His Grace Ch<sup>r</sup>. Lenox  
 This Plate is humblye Dedicated by his Gracie  
 Duke of Richmond,  
 most Obliged & Obed<sup>th</sup> Hum<sup>th</sup> Serv<sup>t</sup> Moses Harris.









To Her Grace the *Duchess of Richmond.*  
*This Plate is humbly Dedicated by her Gracis*



most Oblig'd & Obed<sup>d</sup> Hum<sup>le</sup> Serv<sup>t</sup>

Moses Harris

The caterpillar is green, covered with a shagreen-like skin ; having a horn at the tail, and seven diagonal marks on the side ; the head is triangular. There are two sorts of caterpillars : I presume one male, the other female. They are shewn in the Plate at (c) and (b). They feed on elm and lime ; and are full fed about the middle of August, when they go into the ground and change into chrysalis, shewn at (e) ; and the moths appear the end of May. I have described the moth in four different places in the Plate ; the uppermost of which, at (d), is the female, shewing the upper side : the under side is seen at (g), as drying its wings on coming out of chrysalis. The male is shewn at (f), as pinned down ; with its wings in a resting position. The other moth on the setting board is a female, with the wings expanded, to shew the manner in which the card braces are fixed, in order to the expanding their wings.

Expansion of the wings 2—3 inches.

#### ORGYIA ANTIQUA. THE COMMON VAPOURER MOTH.

Plate XX. fig. *h—p.*

SYNONYMS. *Phalaena (Bombyx) Antiqua, Linn. Syst. Nat. ii. 825. Donovan. Brit. Ins. vol. 1. pl. 16.*

*Albin's Ins. pl. 89. a—e. Wilkes' Brit. Moths, pl. 64.*

*Orgyia Antiqua, Ochsenheimer, Stephens, Curtis.*

*Upper Side.* The antennæ are pectinated. The whole moth is of dark rust colour, having a white spot at the posterior angle of the wings. The female has no wings.

The caterpillar feeds on lime and fruit trees ; is full fed, as at (i), the end of May ; and changes, in a brown web, to a black chrysalis ; and the moth appears about the middle of June. The female caterpillar is larger, and the moth proceeding therefrom covers the web with her eggs, described at (h), which appear like the perforated beads of a necklace. The chrysalis of the female is seen at (l), which is of an olive colour ; that of the male is shewn at (p). The male moth flies in the day time.

Expansion of the wings  $1\frac{1}{6}$ — $1\frac{1}{2}$  inch.

The Rev. W. T. Bree has recorded an instance of the males of this moth adopting the habit of several other Bombyces in *sembling*,—a male having been attracted to the spot where a collector had placed a female. (*Mag. Nat. Hist. No. 10.*)

#### SPHINX CONVOLVULI. THE UNICORN, OR CONVOLVULUS HAWK-MOTH.

Plate XXI. fig. *a—d.*

SYNONYMS. *Sphinx Convolvuli, Linn. Syst. Nat. ii. 798. Donovan Brit. Ins. 7. pl. 228. 229.*

*Wilkes' Eng. Moths, pl. 20-21. Duncan Brit. Moths, pl. 6.*

*Upper Side.* The antennæ are of an ash colour, clubbed at the end, and not thickest in the middle like most of the rest, which are distinguished by the term Hawk, or Sphinx. The eyes are large and brown ; the head and thorax are of a purplish grey ; the latter being almost surrounded by a dark broad streak upon the upper part, formed like a horse shoe. The abdomen is rose colour, ringed with black, and having a broad grey stripe down the middle or upper part, which interrupts or divides each ring. On the hips are two dark red spots, one on each. The superior wings are grey, marked all over with chevron-like streaks of black. The inferior wings are also grey, having four bars of black ; the two middle ones being united toward the abdominal corner.

The caterpillars are of two sorts, the brown and the green: they feed on the convolvulus minor; and conceal themselves in the day time, for fear of the Ichneumon. They are full fed, as at (a), about the middle of July; and change in the earth to a red brown chrysalis, seen at (b). The female moth is figured at (c), and the male at (d), with its proboscis extended.

Expansion of the wings  $4\frac{1}{3}$ — $4\frac{2}{3}$  inches.

This fine species is of considerable rarity, although it has been found in most parts of the country. According to Godart, its eyes, on account of their large size, shine more brightly in the dark than any other species of Moths or Hawk-Moths.

#### HIPPARCHIA PAMPHILUS. THE SMALL GATE KEEPER, OR SMALL HEATH BUTTERFLY.

Plate XXI. fig. e—h.

SYNONYMS. Papilio (Dan. Fest.) Pamphilus, *Linn. Syst. Nat.* ii. p. 791. *Lewin's Pap.* pl. 23. fig. 3. 4. Hipparchia Pamphilus, *Ochsenheimer, Curtis, Stephens. Duncan Brit. Butt.* pl. 26. f. 3. Papiliunculus Aureus Oculatus, Golden Heath Eye, *Petiv. Papil.* pl. v. f. 15. ♀. Pap. idem margin'e fusco, Selvedged Heath Eye, *Petiv. Pap.* pl. v. 6. ♂. Papilio Nephele, *Hubner Pap.* pl. 51. f. 237—239.

*Upper Side.* The antennæ, head, thorax, and abdomen are of a dirty brown. All the wings are of a light brown orange, bordered or fringed with pale buff. The edges of the wings are evenly round. Near the apex of the superior wings is a small dark speck, which, on the under side of the wings, is like the eye of a bird; consisting of a yellow ring, within which is a round black spot, having a small white speck in the centre. The under side of the inferior wings is of a pale sand colour, having a dark cloud covering that half toward the thorax.

The caterpillar is green, as at (e). They live during the winter; and change into chrysalis, hanging by the tail, as at (f); and the flies appear in April. The upper side of the fly is seen at (g), and the under side at (h). There are three broods of this fly in one summer: the first in April, the second in June, and the third in August.

Expansion of the wings  $1\frac{1}{8}$ — $1\frac{1}{2}$  inches.

This pretty butterfly is extremely abundant on heaths and pastures throughout the country. It varies in having the spottings of the wings more or less obliterated.

#### PLUSIA CHRYSITIS. THE BURNISHED BRASS MOTH.

Plate XXII. fig. a—c.

SYNONYMS. Phalæna (Noctua) Chrysitis, *Linn. Syst. Nat.* ii. p. 843. *Donovan Brit. Ins.* 4. pl. 137. *Albin's Ins.* pl. 71. fig. a—d. Plusia Chrysitis, *Ochsenheimer, Stephens. Duncan Brit. Moths,* pl. 25. fig. 4.

*Upper Side.* The antennæ are like fine threads. The thorax and abdomen are brown, and crested. The superior wings are bright and shining, like burnished brass, having some dark brown clouds. The inferior wings are of a pale brown, as is all the under side.

The caterpillar feeds on white archangel; lies during the winter; and is full fed in July, as at (a). It changes to a black shining chrysalis, in a coarse brown web, as at (b); and the moth appears the beginning of August. The moth is described at (e).

Expansion of the wings one inch and three-quarters.



Mo: Harris ad Vn

To Sir Nathaniel Curzon Bart<sup>o</sup> This Plate is most humbly Dedicated.  
 by His most Obliged and Humble Servant Moses Harris







M. Harris ad. Sculpsit.

To the Hon<sup>ble</sup> Will<sup>m</sup> Rich<sup>d</sup> Chetwynd. This Plate is  
Most Humbly Dedicated by His most Oblig<sup>g</sup> & Obed<sup>t</sup> Serv<sup>r</sup> Mr<sup>s</sup> Harris



This insect has much of the habit of the Humming-Bird Hawk Moth; frequenting gardens, and hovering over flowers, from which it extracts the honey by means of its long and spiral tongue.

NÆNIA TYPICA. THE DARK GOTHIC MOTH.

Plate XXII. fig. *d—g.*

SYNONYMS. *Phalæna* (Noct.) *Typica*, *Linn. Syst. Nat.* ii. p. 857. *Albin's Ins. pl. fig. 21. a—d.*  
*Noctua Venosa*, *Hubner.*  
*Nænia Typica*, *Stephens.*  
*Mania Typica*, *Treitschke.*

*Upper Side.* The antennæ are like threads. The thorax and abdomen are brown, crested with tufts of hair. The superior wings are brown, and divided by white lines into small squarish compartments, some of them appearing like arches. The inferior wings are brown and plain.

The *under side* is pale brown, having some darkish strokes crossing the wings; the tongue is spiral. The upper side is seen at (*f*), and the under side at (*g*).

The caterpillars are found the beginning of April, at the roots of nettles, or the bottom of the stalks of water betony, which grows against banks: when full fed they appear as at (*d*); and change into chrysalides, in a web, on the surface of the earth, the beginning of May; and the moths appear in one month after. The chrysalis is shewn at (*c*).

Expansion of the wings one inch and a half.

HEPIALUS SYLVINUS. THE LARGE ORANGE, OR EVENING SWIFT MOTH.

Plate XXII. fig. *h—m.*

SYNONYMS. *Phalæna* (Noct.) *Sylvina*, *Linn. Syst. Nat.* ii. p. 834.  
*Hepialus Sylvinus*, *Ochsenheimer*, *Stephens.* *Curtis Brit. Ent. pl. 185. Duncan Brit. Moths*, pl. 14. fig. 1.  
*Hepialus Lupulinus*, *Hubner*, *Haworth.*  
*Golden Swift*, *Harris's Exposition*, pl. 4. fig. *f.*  
*Large Evening Swift*, *Ditto*, pl. 13. fig. 6.  
*Phalæna* (Noct.) *Hecta*, *Harris's Aurelian*, 1st edit. (sed nec *Linn.*)  
*Hepialus Crux*, *Fabricius.*

*Upper Side.* The antennæ are very short, scarcely perceptible. The thorax and abdomen appear of a yellow brown, covered with ragged hair. The wings are of a yellow brown colour: the superior have a few longish white spots, which lie transversely. The female is seen at (*l*), and the male at (*m*): their wings appear almost bare of farina.

The caterpillars are naked, and of a cream colour, having a red head. They feed under ground, on the roots of grass. They become full fed about the end of April, when they appear as at (*i*); and change to the chrysalis in a slight web, which is exactly described at (*m*); and the moths appear the end of May.

Expansion of the wings one inch.

COCCINELLA 7-PUNCTATA. THE SEVEN-SPOTTED LADY COW, OR LADY BEETLE.

Plate XXII. fig. *n—t.*

SYNONYMS. *Coccinella* 7-punctata, *Linn. Syst. Nat.* ii. p. 581. *Donovan Brit. Ins.* 2. pl. 39. fig. 5. & pl. 40. fig. 1. *Wood Linn. Genera*, pl. 10.

The head and thorax are black, having a white spot on each side of the latter. The elytra are red, having seven small round spots thereon; one of which, on the back, is divided into two parts by the suture. The legs and abdomen are black.

The caterpillar feeds [upon Aphides] on orach, &c. and appears full fed about the end of July, as represented at (o) (o); when it fastens itself up by the tail, as at (q) and (r), and changes into an orange-coloured chrysalis: which has the faculty, when disturbed, to raise itself almost erect, with the head upward, with a quick and sudden motion, as shewn by the line at (r). The beetle appears in seven days. The female generally lays her eggs in regular order; each of which appears as at (p), in shape somewhat like a cask. About ten or twelve days after they are first laid they change from a green to a wainscot colour; and a black triangular mark appears toward the top of each, over which is seen two spots of bright red, as in the plate; soon after which the beetle [larva?] appears.

Length of the body a quarter of an inch.

#### COSSUS LIGNIPERDA. THE GOAT MOTH.

##### Plate XXIII.

SYNONYMS. *Phalæna (Bombyx) Cossus*, *Linn. Syst. Nat. ii. 827. Donov. Brit. Ins. 4. pl. 114.*  
*Albin's Ins. pl. 35. Wilkes' Eng. Moths, &c. pl. 31.*  
*Cossus Ligniperda, Fabricius, Stephens. Curtis Brit. Ent. pl. 60. Duncan Brit. Moths,*  
*pl. 14. fig. 2—3.*

*Upper Side.* The antennæ are very strong, and toothed on the under side like a saw. The thorax has a broad yellow collar, like a ruff, and a strong black mark or stroke a little above the scutulum. The superior wings are of an ash colour, covered all over with black undulated lines, which join and interrupt each other in an irregular manner, not easily described. The inferior wings are somewhat darker, but marked in a similar manner to the superior.

The *under side* is like the upper, but paler.

The caterpillar feeds on the wood within the body of the willow tree; also on oak. In some places, particularly in Cornwall, it is called the Auger Worm, from the holes it makes in the timber, which appear as if bored with that instrument. It is not full fed till the third year after it comes from the egg, being then about four inches and a half in length; and, in my opinion, very disagreeable to the eye, appearing like a large maggot, of a reddish buff colour on the belly and sides, but on the back of a deep red brown, like raw beef. The head is black and shining; behind which, on the first joint, it hath a spot of a remarkable shape, which is also black and shining. When ready for transformation it spins a strong web, within three or four inches of the entrance, wherein it changes to a brown chrysalis, seen at (e). The case is composed of little bits of wood, which it bites off with its forceps; it is like saw-dust, which is interwoven with the web, the inside being made delicately smooth, like white satin. At the expiration of two months the moth appears. It must here be observed, that when the moth leaves the chrysalis, the chrysalis appears half out of the tree, as represented at (d); being armed with strong spinules round every division of the tail part, it forces itself forward through the case to the entrance of the hole; and is pushed further out, before the moth can disengage itself. I have given a figure of the moth sitting close-winged at (e), and as flying at (f).

I cannot break off the history of this moth, without mentioning a chrysalis of one of them which I took out of a hole of a willow tree. It was remarkably black and soft, so that I thought the moth would, in a short time, make its appearance; after waiting two or three days in vain, I broke it open, and, to my surprise, it was so full of minute ichneumons that it appeared as if crammed with a fine black powder: on a moderate computation there might be twenty thousand.



To the R<sup>e</sup> Hon<sup>ble</sup> the Earl of Suffolk  
This Plate is most humbly Dedicated  
by his Lordship's most Obed<sup>t</sup> Serv<sup>t</sup>  
Moses Harris.





How this wretched insect underwent its transformation, while so full of these destroying animals, is to me very extraordinary.

Expansion of the wings 3— $3\frac{3}{4}$  inches.

“ In breaking up the decayed pollards,” observes the author of the *Journal of a Naturalist*, “ we not unusually find the grub of the Goat Moth in all the stages of its growth ; but more generally observe them without inhabitants, yet perforated with paths large enough to admit the finger. I suspect that these auger-worms are the primary cause of the decay of the tree, having often observed their perforations, and found them, both large and small, in the solid spur or root of the tree, when the upper portion—having been bored and in a state of decline—is abandoned by them. Those that are full-fed appear to form their cases in that part which has lost coherency ; while the younger and unperfected creatures mine their way and obtain nutriment in the solid timber ; thus killing the tree by inches, when rain and moisture find lodgment, and complete the dissolution. One year’s preparation is the period usually assigned to the larva of most insects, before they arrive at their perfect state ; but by the Goat Moth three years are required before it attains its winged state from the egg : consequently, for the larger portion of its life it is occupied in these destructive operations, and thus this creature becomes a very powerful agent in reducing these Titans of the vegetable world—crumbling them away to their original dust : for what was decreed the termination and punishment of man, is found in active operation throughout the whole chain of nature’s works, which are but dust, and unto dust return ; continuing an endless series of production and decay—of restoration and of change. All these larvæ which I have observed in the colder portions of our year are hard, stiff, and torpid, but soon become relaxed and animated by the warmth of the hand ; thus they probably remain quiet during the winter months, but revive in spring, and recommence their ravages in the tree. The caterpillar of this moth I believe to be the largest of any of those of the British Lepidoptera, and when full fed exceeds in size that of the Death’s-head Sphinx.” The disgusting appearance of the larva, arising from its large size, naked body, and raw fleshy colour, united with the emission of an unpleasant scent, (whence its name of the Goat Moth) renders this creature by no means a favourite ; although it has afforded to a Dutch naturalist, Lyonnet, the materials for one of the most elaborate anatomical treatises ever published.

The female lays but one course of eggs, but these generally amount to 1000 in number, and are always deposited at the base of the trees, whence the caterpillars penetrate the bark wherever they can find the easiest entrance : the eggs are small in proportion to the size of the imago. The smell of the larva is so strong as to be easily perceived by persons passing near trees infested with it. The green wood-pecker feeds upon these caterpillars, and its stomach, on dissection, has an intolerable stench. In addition to the willow and oak, the Cossus feeds on the wood of the elm, alder, ash, walnut, beech, lime, and poplar. Many remedies have been proposed, but that of Latreille appears to be the most approved of in France.—This consists in surrounding the base of the tree, where it has been observed that the females always deposit their eggs, with a thick coating of a mixture of clay and cow-dung, which the insects cannot penetrate. (*Loudon’s Arboretum Britannicum*, p. 1387.)

The object as well as the seat of the peculiar odour alluded to above, seem not well understood. Some have conjectured it to proceed from a fluid evacuated from the mouth and discharged, to soften the wood in which they burrow ; but its powerful jaws are amply sufficient for such purpose, and besides, the numerous other lignivorous larvæ are unprovided with such a secretion : moreover, should such be the case, the discharge, and consequently the scent, would only be perceived when the jaws were at work ; but this unpleasant odour is always perceptible. The microscope too does not manifest the exudation of any fluid. (*Knapp.*)

The Linnæan specific name, now converted into the generic one, has been given to this insect from the supposition that this creature was the celebrated Cossus of the ancient Roman epicures ; although its peculiar characters seem very unfitted, according to our modern notions of epicurism, to render it a delicious morsel to the gourmand : but, “ *De gustibus non est disputandum.* ”

#### MAMESTRA PERSICARIÆ. THE DOT MOTH.

Plate XXIV. fig. *a—e*.

SYNONYMS. *Phalæna* (Noct.) *Persicariæ*, *Linn. Syst. Nat.* ii. 847. *Donov. Brit. Ins.* 9. pl. 317.

*Albin's Ins.* pl. 77. fig. *a—d*.

*Mamestra Persicariæ*, *Ochsenheimer, Stephens.*

*Upper Side.* The antennæ are like crooked threads. The thorax and abdomen are crested. The superior wings are very dark brown, having a number of black waved lines : in the centre of the wing on the bar tendon is a remarkable white spot, tinted in the middle with brown. The inferior wings are brown on the fan edges, but light toward the body.

The *under side* of the superior wings is brown, becoming lighter toward the fan edges. The inferior are light, having a dark band crossing over the fan edges, and a dark spot in the middle of the wing. See the moth in the Plate, at (*e*) and (*d*).

The caterpillar feeds on nettles, and the greater bind-weed, &c. There are two kinds of them, the one green, the other brown ; the latter of which produce the male. They are full fed, as at (*a*) and (*b*), the end of August ; when they change in the earth to brown shining chrysalides ; and the moths appear about the end of May.

Expansion of the wings one inch and a half.

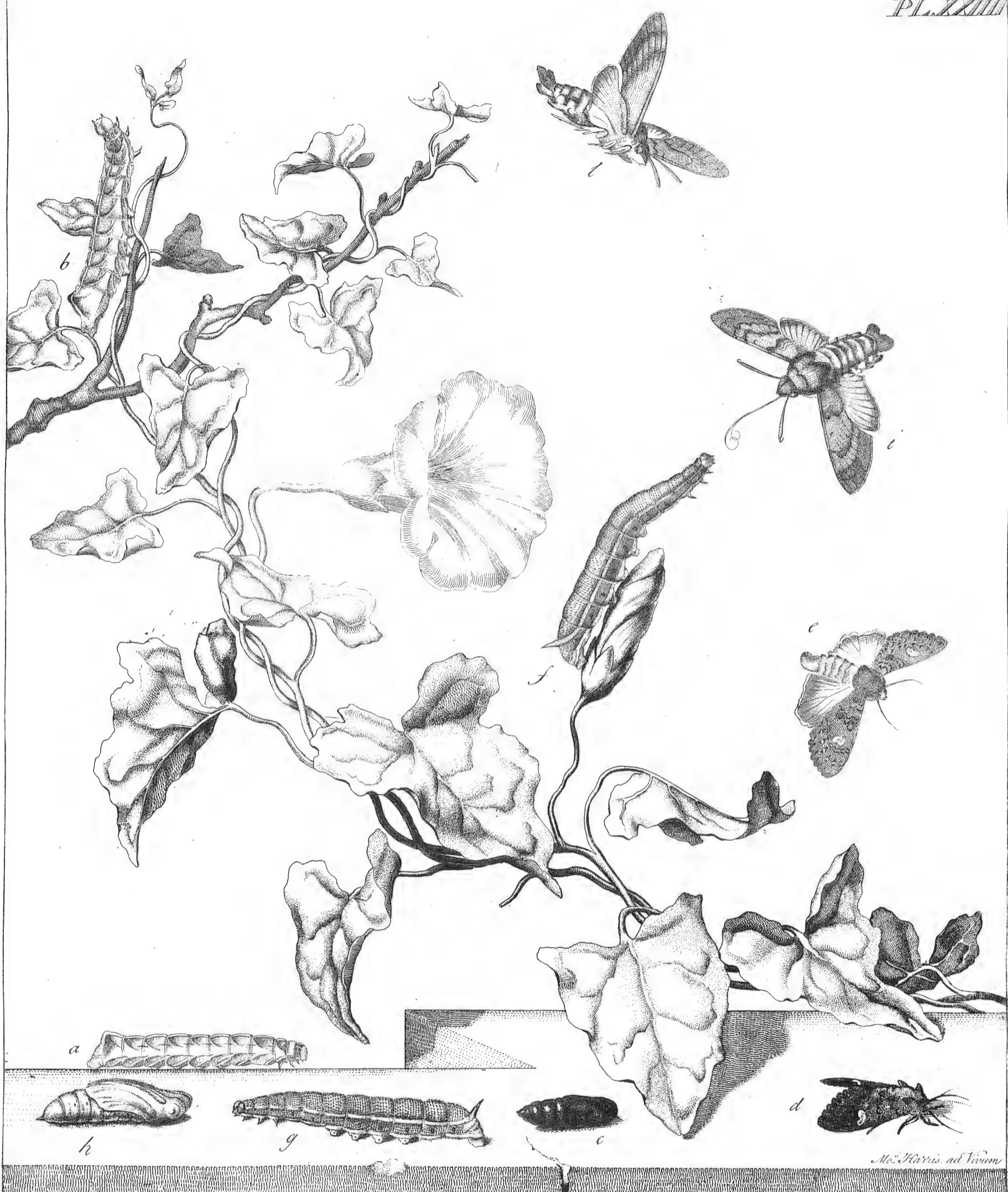
#### MACROGLOSSA STELLATARUM. THE HUMMING-BIRD HAWK-MOTH.

Plate XXIV. fig. *f—l*.

SYNONYMS. *Sphinx Stellatarum*, *Linn. Syst. Nat.* ii. p. 803. *Donov. Brit. Ins.* vol. vii. pl. 155.

*Macroglossa Stellatarum*, *Ochsenheimer, Stephens. Curtis Brit. Ent.* pl. 747. *Duncan Brit. Moths*, pl. 12. fig. 1. 2.

*Upper Side.* The antennæ are clubbed toward the end ; the thorax dark brown ; abdomen dark brown, furnished with fan-like tufts of hair on each side, having a white spot on each. The anus is also furnished with a tuft of the like kind, resembling the tail of a bird. The superior wings are of a dark brown, having two bars, which cross the wing, dividing it into three parts, between which, near the sector edge, is a small black speck. The inferior wings are of a brown orange colour, which deepens to a red brown along the fan edge.



To Sir Armine Wodehouse Bart.  
Dedicated by His most Obliged  
and Obedient Servant, Moses Harris





The caterpillars are of two sorts, some green, others brown. They feed on many different kinds of herbs, particularly ladies-bedstraw. The different coloured caterpillars are seen at (*f*) and (*g*) : the chrysalis is shewn at (*h*) : the upper side of the moth is described at (*i*), and the under at (*l*).

Expansion of the wings two inches.

“ The Humming-bird Hawk-Moth,” observes the author of the *Journal of a Naturalist*, “ visits us occasionally in some numbers ; frisking about all the summer long, and in very fine seasons continuing with us as late as the second week in October. The vigilance and animation of this creature are surprising, and seem to equal those of its name-sake, that splendid meteoric bird of the tropics, that “ winged thought,” as some one has called it ; though our plain and dusky insect can boast none of its glorious hues. Our little sphinx appears chiefly in the mornings and evenings of the day, rather avoiding the heat of the mid-day sun ; possibly roused from its rest by the scent, that aromatic soul of flowers, which is principally exhaled at these periods ; delighting in the jessamine, marvel of peru, flax, and such tubular flowers, and it will even insert its long flexible tube into every petal of the carnation, to extract the honey-like liquor it contains. It will visit our geraniums and green-house plants, and whisking over part of them with contemptuous celerity, select some composite flower that takes its fancy, and examine every tube with rapidity ; hovering over its disk with quivering wings, while its fine hawk-like eyes survey all surrounding dangers. The least movement alarms it, and it darts away with the speed of an arrow, yet returns, and with suspicious vigilance, continues its employ, feeding always on the wing. Nature seems to have given this creature some essential requisites for its safety ; its activity, when on the wing, renders its capture difficult, and when it rests it is on a wall, the bark of a tree, or some dusky body that assimilates so nearly to its own colour as to render it almost invisible, though watched to its settlement, and the larva is seldom found. We sometimes see it enter our doors, attracted by flowers in the open windows ; but it seems to be immediately aware of its danger, disappears in an instant, and is safe from capture. Wild and fearful as this creature is by nature, yet continued gentle treatment will remove much of its timidity, and render it familiar to our presence. Perfectly free from any annoyance, as they are when ranging from sweet to sweet on my borders, and accustomed to a close inspection of all their operations, I have frequently touched their wings with my fingers while hovering over a flower, and dipping their long tubes into the corolla of a geranium ; they would retire, a little confused with such freedoms and interruptions, but experiencing no harm, they would return and finish their meal, unmindful of such petty annoyances. I have known this creature, like some other insects, counterfeit death when apprehensive of danger ; fall on its back and appear in all respects devoid of life when in a box, and as soon as a fit opportunity arrived, dart away with its usual celerity.”

## SATURNIA PAVONIA MINOR. THE EMPEROR MOTH.

Plate XXV. fig. *a—i—t.*

**SYNONYMS.** Phalæna (Attacus) Pavonia Minor, *Linn. Syst. Nat.* ii. 810. *Barbut Gen. Ins.* pl. 10. fig. 7. ♂. *Albin's Ins.* pl. 25. f. 37. *a—h.* *Wilkes' Eng. Moths, &c.* pl. 32. 33. Phalæna (Bomb.) Pavonia, *Linn. Faun. Suec.* 1099. *Donov. vi. pl. 1. ♂.* 8. p. 254, ♀. Bombyx Pavonus, *Haworth.* Bombyx Carpini, *Hubner.* Saturnia Pavonia Minor, *Leach, Kirby, Stephens, Curtis.* *Duncan Brit. Moths,* pl. 17. fig. 1. ♀. 2. Larva.

*Upper Side.* The antennæ are pectinated. The head small, lying beneath the thorax. The thorax is of a greyish brown. The wings, which are round at the fan edges, are light grey, having several broad engrailed brown bars; near the middle of each wing is an eye-like spot, composed of concentric circles.

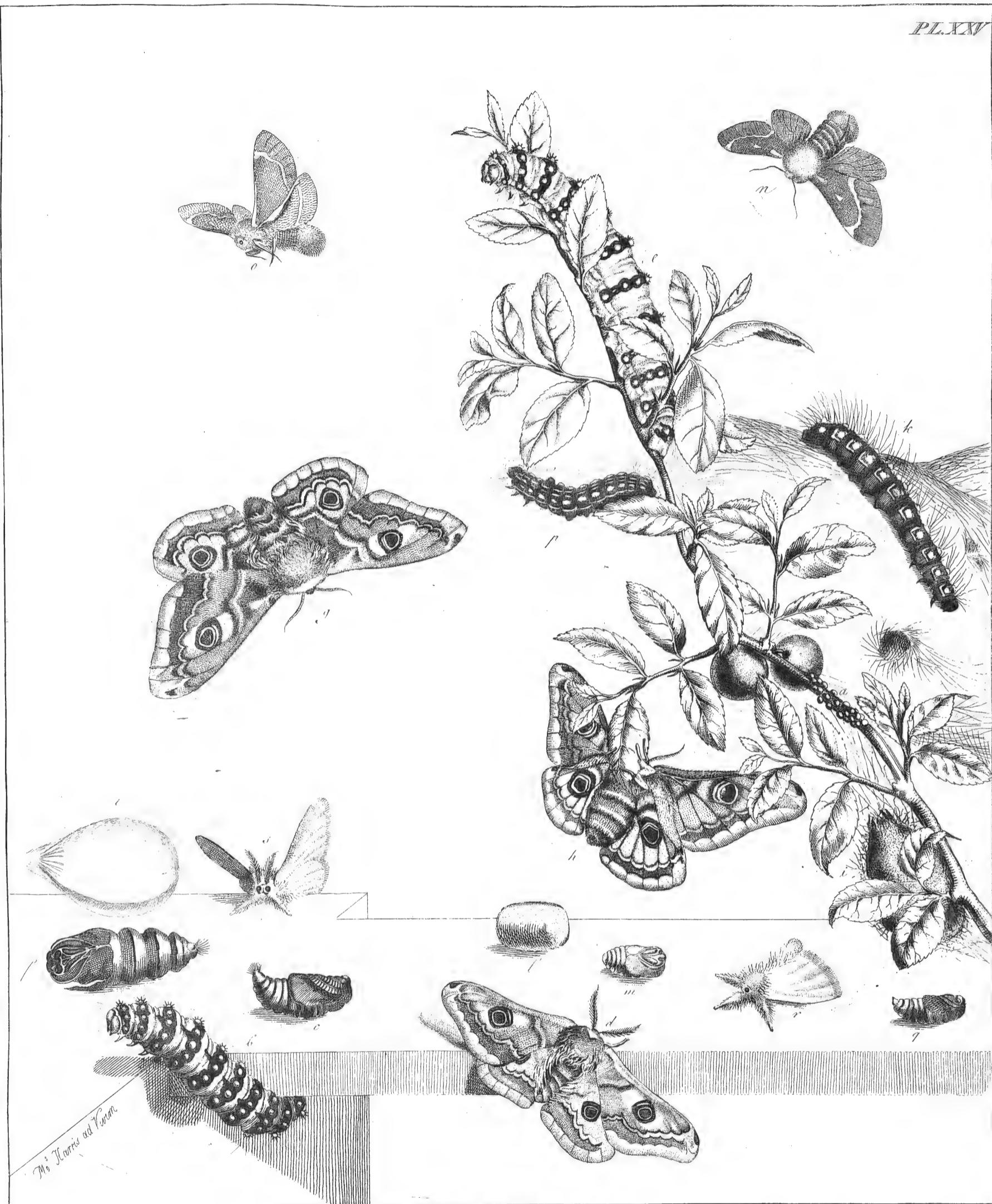
The *under side* is similar to the upper; the tongue is wanting. The inferior wings of the male are of an orange colour.

The caterpillars are green, encircled with irregular belts of black, each of which is ornamented with bosses of orange colour, armed with strong black points. See the fig. at (b) which produces the male; and that on the food, which produces the female, hath always less black on the body. They feed on black-thorn and willow; are full fed about the middle of July, when they spin themselves up in brown cases, seen at (i), and change into chrysalides, in form and colour seen at (c). The moths appear the beginning of April. The figure at (f) is an empty shell of the female moth, which is to show in what manner the abdominal part of most chrysalides of the Lepidoptera are distended when the fly leaves it.

The web or case wherein they change to the chrysalis is greatly to be admired, being so wonderfully formed for the security of the inclosed insect: the entrance, or part designed by nature for the coming forth of the moth, is almost impossible for any insect to enter; and should any gain admission into the mouth, (which they cannot do without being very much embarrassed with the web) they would meet with a second and more impassable defence, which is set round with a sort of spikes, that meet in a point or centre, something like the contrivance seen in some kind of traps for various animals, which easily admit the animals one way, but wholly forbids and opposes their return. The figure at (t), which is half of a case, supposed to be dissected lengthways, thoroughly shews it.

Expansion of the wings  $2\frac{1}{2}$ — $3\frac{1}{2}$  inches.

This fine moth is the only British representative of the Linnæan Phalæna Attacus, a group of great extent, which comprises almost all the large exotic species of Bombycidæ, many of which have the fore wings ornamented with the most beautiful eye-like spots, whilst others have them replaced by a large talc-like transparent spot. In addition to the plants mentioned above, the caterpillars feed on heath, alder, oak, bramble, rose, elder, birch, strawberry, fruit-trees, whortle-berry, &c. The female deposits between two and three hundred eggs, which she attaches with gluten to the stems of plants, in several packets placed at some distance from each other. The moth is of common occurrence throughout the kingdom. In the Entomological Magazine, No. 12, is contained a statement by Mr. Edmonds of Worcester, that a perfect pair of this insect, male and female, had been produced from a



To the Right Honourable the Countess of Berkley  
This Plate is humbly dedicated by her Ladyship's most Obedient & Humble Servant Moses Harris



single very fine larva. A correspondent, however, in a subsequent number (No. 15), has very rationally thrown some doubts on this singular statement.

An anonymous writer in the Magazine of Natural History (No. 6), has described the developement of this insect from the pupa, and the gradual growth of its wings, the insect in a quarter of an hour having attained its full size, but no strength: previous to which he had observed the pulsation of the abdomen was sixty in a minute, the wings did not however attain their full power for five hours, when it discharged a copious evacuation.

#### ERIOGASTER LANESTRIS. THE SMALL EGGER MOTH.

Plate XXV. fig. *k*—*o*.

SYNONYMS. *Phalæna (Bombyx) Lanestræs*, *Linn. Syst. Nat.* ii. p. 815. *Donovan Brit. Ins.* vol. vi. pl. 310. ♀. *Albin's Ins.* pl. 19. fig. 26. *a*—*d*. *Wilkes' Eng. Moths*, pl. 53. *Eriogaster Lanestræs*, *Germar, Stephens*.

*Upper Side.* The antennæ are like threads. The thorax and abdomen are brown. The superior wings are of a dark red brown toward the thorax, in which are placed two white spots; but the part toward the fan edges is lighter, and is separated by a white line. The inferior wings are brown.

The *under side* is a faint resemblance of the upper side.

The caterpillar feeds on the black-thorn; is full fed as at (*k*), when it spins itself up in a cream colour case, like that at (*l*); wherein it changes to a short thick chrysalis, of a nut brown colour, seen at (*m*); and the moth appears about the middle of March; the upper side of which is seen at (*n*), and the under at (*o*). In breeding this moth from the caterpillar, the web must be put in the cage with the caterpillars, otherwise they will all certainly perish. This moth has no tongue.

Expansion of the wings  $1\frac{1}{6}$ — $1\frac{5}{6}$  inches.

“The parental cares of nature,” observes Mr. Haworth, “which are so conspicuously manifested towards the most insignificant of her productions (if any can be called such), are extended towards this poor insect in a very extraordinary and interesting manner. Doomed to a regular appearance in the winged state at the termination of the cold and ungenial month of February, nature (that it may not fail and become extinct) reserves a small portion of it annually, in the pupa state, until the February following that of its pupation, and sometimes even until the third occurrence of that frigid month; denying their emancipation all the intermediate time, and thus effectually securing, by these unusual means, the safety and perpetuation of an animal, small, it is true, but whose annual existence at that inclement season, in the winged state, is probably of more consequence in the intricacy of its great Creator's plans than we are at present aware of, although He constantly exposes it to the dangerous vicissitudes of winter; for

“Each shell, each crawling insect, holds a rank  
Important in the plan of him who framed  
This scale of beings: holds a rank, which lost  
Would break the chain, and leave behind a gap  
Which Nature's self would rue.”

STILLINGFLEET.

When an Aurelian possesses a brood of this moth, he readily learns, on the arrival of the month of February, which of his pupa will become winged that year ; this always happens to be for the greater number, and its approach is denoted by the swelling of the large belts of the pupa. Those which are intended to rest until another season do not swell until that season approaches. The cause of this swelling is difficult to explain, and cannot be owing to heat, because all the pupa—those which do not, as well as those which do swell—are kept in equal temperature, and experience the very same treatment. (*Lepid. Britan.* p. 125.)

#### PORTHESSIA CHRYSORRHÆA. THE YELLOW TAIL MOTH.

Plate XXV. fig. *p*—*s*.

SYNONYMS. *Phalæna* (Bomb.) *Chrysorrhæa*. *Linn. Syst. Nat.* ii. 822. *Donovan Brit. Ins.* vol. i. pl. 10.

*Albin's Ins.* pl. 87. fig. *e*—*i*. *Wilkes' Eng. Moths*, pl. 59.

*Porthesia Chrysorrhæa*, *Stephens*.

*Arctia Chrysorrhæa*, *Leach*, *Curtis*.

*Bombyx Aurifluus*, *Haworth*, ♂.

*Upper Side.* The antennæ are pectinated. The thorax is covered with hair, which stands erect. The whole moth is white as snow, except the tuft at the anus, which is yellow ; and the eyes, which are black.

The caterpillars feed on oak and black-thorn : remaining during the winter spun up in small cases ; in spring they come forth, and feed again, till the beginning of June ; when they are full fed, as at (*p*), and change into chrysalis, within a spinning ; the chrysalis shewn at (*p*). The moths appear the end of June. I have described the female at (*r*), and the male at (*s*). They are very common, and easily taken. This moth has no tongue.

Expansion of the wings  $1\frac{1}{4}$ — $1\frac{5}{6}$  inches.

#### THECLA RUBI. THE GREEN HAIR STREAK BUTTERFLY.

Plate XXVI. fig. *a*, *b*, *d*, *q*.

SYNONYMS. *Papilio* (Pleb. Rur.) *Rubi*, *Linn. Syst. Nat.* ii. 791. *Lewin's Papil.* pl. 44. *Donov.*

*Brit. Ins.* vol. 13. pl. 443. *Wilkes' Eng. Moths & Butt.* pl. 118. *Albin's Ins.* pl. 5. fig. 8.

*Thecla Rubi*, *Leach*, *Stephens*, *Curtis*. *Duncan Brit. Butt.* pl. 28. fig. 3.

*Papilio Tespis*, *Harris*, 1st edit. (nec *Linn.*)

*Upper Side.* The head, thorax, and abdomen are small and brown : the wings are also brown.

The *under side* is green ; the inferior wings having three white streaks or spots.

The caterpillar is green, formed like a wood louse or oniscus, as may be seen at (*a*). It feeds on the buds of the bramble : becomes full fed about the end of July, when it ties itself up in the same manner as the Purple Hair Streak ; and changes into a chrysalis like that at (*b*). The fly appears the middle of April. The upper side is shewn at (*d*), and the under side at (*q*).

Expansion of the wings 1— $1\frac{1}{3}$  inches.

I have always found this to be the commonest species of the genus to which it



To the Rt. Hon<sup>ble</sup> Lady Spencer this Plate is most humbly Dedicated by  
her Ladyship's most obliged humble Servt. Moses Harris.



belongs, at least in the south parts of England, although it appears much rarer in the more northern parts of the kingdom ; it is, however, widely dispersed. There are two broods in the course of the year, the first appearing at the beginning of the summer, and the second at the beginning of August.

#### ARGYNNIS AGLAIA. THE DARK GREEN FRITILLARY BUTTERFLY.

Plate XXVI. fig. *o—p.*

SYNONYMS. *Papilio* (Nymph. *Phal.*) *Aglia*. *Linn. Syst. Nat.* ii. 785. *Lewin's Papil.* pl. 11. *Donov. Brit. Ins.* 9. pl. 302. ♂.  
*Argynnis Aglia*, *Ochsenheimer*, *Leach*, *Stephens*. *Duncan Brit. Butt.* pl. 15. fig. 1.  
*The Great Fritillary Butterfly, with Silver Spots*, *Wilkes Eng. Moths & Butt.* pl. 115.

*Upper Side.* The head, thorax, and abdomen are brown. The wings in general are orange brown, spotted all over with black, as may be seen at (*o*).

The *under side* of the superior wings is yellow, and spotted with black ; having a series of pearl-like spots along the fan edge, seven in number. The inferior wings are also yellow, having twenty-one spots of a pearl-like or silver appearance, exclusive of that on the abdominal edge, see fig. (*c*). This fly is very like that in Plate 28 ; but that is brown between the silver spots, this clouded with green.

The caterpillar had not been seen by Harris. They fly in June, in private recesses of woods. Expansion of the wings  $2\frac{1}{3}$ — $2\frac{5}{6}$  inches.

This handsome species occurs plentifully in various parts of the south of England, in woods, meadows, and heaths. It is also found in various parts of Scotland, and abundantly near Durham. The caterpillar is dusky, with a pale yellowish back, and a row of eight square red spots along each side. It feeds on the dog's violet.

#### HYDROCHARIS CARABOIDES. THE BLACK OVAL WATER BEETLE.

Plate XXVI. fig. *e—i.*

SYNONYMS. *Dytiscus Caraboides*, *Linn. Syst. Nat.* ii. p. 664. *Martyn Coleop.* pl. 34. fig. 28.  
*Hydrophilus Caraboides*, *Fabricius*, *Leach*. *Samouelle Compend.* pl. 3. fig. 16. *Curtis Brit. Ent.* pl. 159.  
*Hydrocharis Caraboides*, *Latreille*, *Westw. Introd. to Mod. Class. (Gen. Syn.)* p. 9.

This beetle is of a dark olive colour on the back, as at (*g*) : the belly is somewhat lighter, inclining to an olive brown, as at (*h*) ; the hinder feet are formed for swimming.

The larvæ, which is represented at (*e*), may be found of different sizes, in June and July, in stagnant ponds : their food is commonly the caterpillars of other water insects ; indeed they are so rapacious, that they will destroy insects much larger than themselves. When ready for their change they go into the earth, making a hollow cell, wherein they change to the pupa, shewn at (*f*), and the beetles appear in August. It is shewn flying at (*i*), displaying its membranaceous wings.

Length of the body three-quarters of an inch.

## LIBELLULA DEPRESSA. THE FLAT BLUE-TAILED LIBELLULA.

Plate XXVI. fig. *k*—*m*.

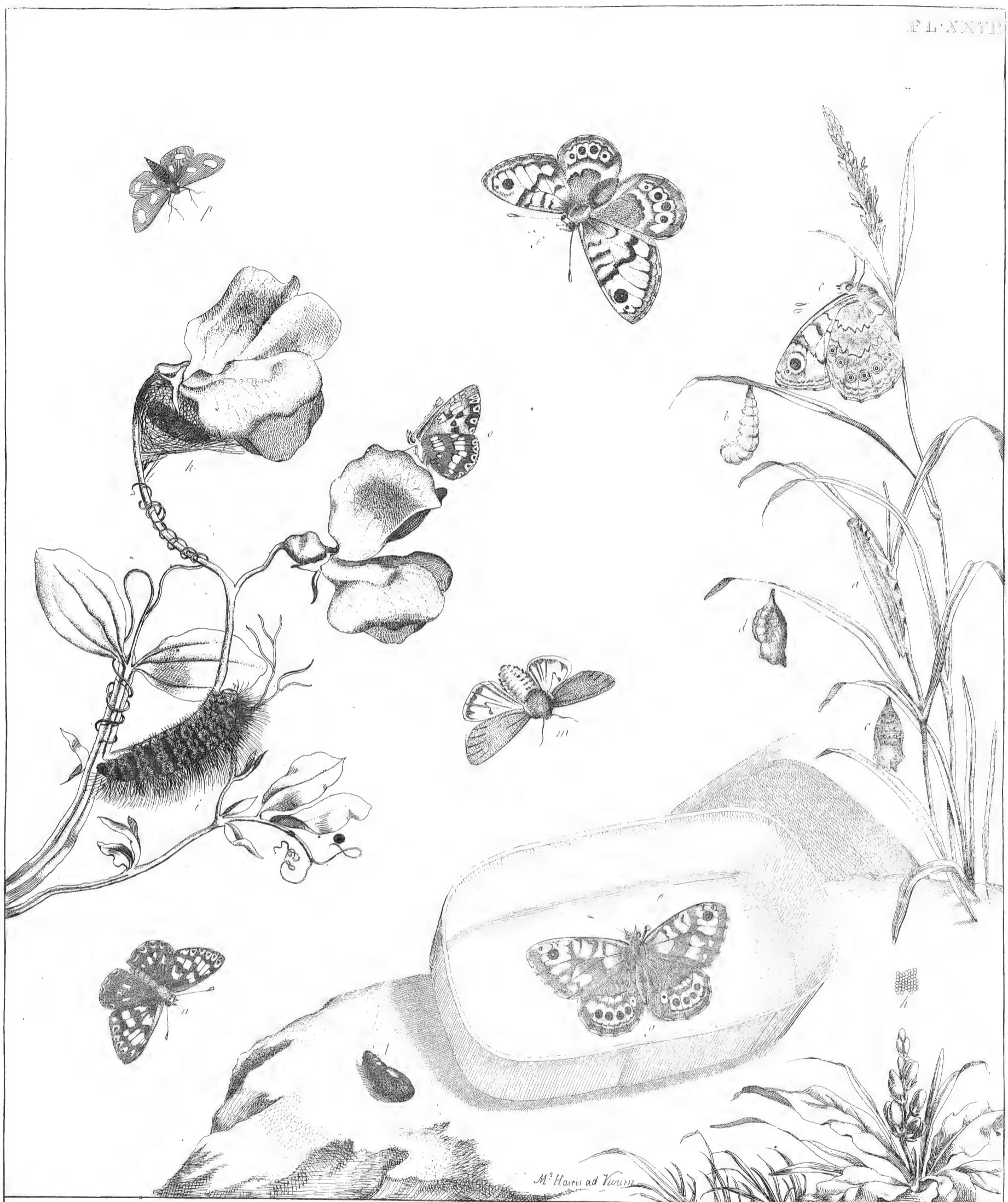
SYNONYMS. *Libellula depressa*, *Linn. Syst. Nat.* ii. p. 932. *Donovan Brit. Ins.* vol. i. pl. 24. ♀.  
vol. iii. pl. 81. ♂. vol. ii. pl. 44. Larva.

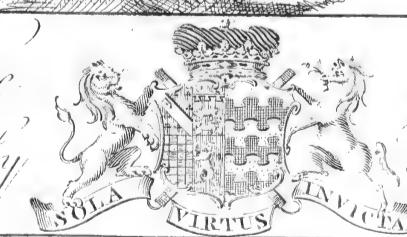
The immature insect is found in foul ditches and stagnant waters, of different sizes, any time in the year; it is of a dark muddy colour. When full fed and ready to undergo its transformation to the winged state, it appears as a pupa at (*k*); it then crawls up out of the water by the help of a stone, stick, or piece of grass, where, holding fast by the legs, the skin on the back splits or bursts, and the libellula draws itself gently out, as at (*l*); it then holds by the legs, with its wings hanging downwards, where they gradually stretch and dry, and are quickly fit for flight. The libellula at (*n*) is of a different kind, (*Libellula cancellata*, *Linn. ? Syst. Nat.* ii. p. 902. *Donov. Brit. Ins.* 14. pl. 472.) although by some it has been mistaken for the male to the blue-tailed. But it is a mistake, the blue-tail being the male, the female of which has a flat brown tail. I have given an exact drawing of the male at (*m*).

Expansion of the wings three inches.

The remarkable difference existing between the appearance of the larva and perfect states of this tribe of insects, is equalled by that of the element in which they reside at these different periods of existence, as well as by the difference in their motions; the larva being a slow inactive creature, and the imago one of the most agile of the insect race. In all their states they are formed for rapine; and the hawk-like motions of the fly chasing minute insects, upon which it subsists in the air, are very elegant. In all its states, however, it is beautifully adapted in its organization for its mode of life: the larva, slow and hideous, has need of an instrument enabling it to obtain its prey with adroitness; and the singular construction of the organs of its mouth, some of which are transformed into a large mask with a pair of hooks, capable of being extended at will to a considerable distance in front of the body, has attracted the attention of most Entomologists. The general structure of the perfect insect is not less beautifully adapted for the performance of its habits. “Observe the Dragon Fly, the emperor of his tribe, his wings rustle as he hovers stationary and hawk-like in the air; his appetite is insatiable; his food the active occupants of his own element; it is given to him in charge to set bounds to the increase of the insect race; he beholds his prey afar off; he darts on it like the rapidity of a lightning flash; to devour it ere life is departed is the work of an instant; he sails round and round; he soars up and down; when the sky is serene, he seeks his prey, like the swallows, almost beyond the reach of human sight. What organs does such an animal require? Are they not these,—eyes, mouth, and wings? How has nature provided for his wants? Regard his head—below, it is all mouth; above, it is one continuous eye. Contemplate his wings—their character is strength and lightness, power and activity. His body is slender and graceful; like a rudder, it serves as an instrument wherewith to shape his course. Porrected feelers, whether cranial, labial, or maxillary, would be comparatively useless to an animal whose dependence for support is on the keenness of its vision and the velocity



M<sup>rs</sup> Harris ad Verum

To Her Grace the Dutchess of Norfolk  
 This Plate is humbly dedicated by  
  
 Her Grace's most devoted Servant,  
 Moses Harris.

of its flight. We find them but little prominent ; his every organ is of the required size. The same law obtains as certainly and unvaryingly in form. There is truly a best form and a best size, and nature always provides both."—*Newman in Entomol. Magazine.*

#### PHRAGMATOBIA FULIGINOSA. THE RUBY TYGER MOTH.

Plate XXVII. fig. *i*—*m*.

SYNONYMS. *Phalæna (Noctua) fuliginosa*, *Linn. Syst. Nat.* ii. 836. *Donovan Brit. Ins.* iii. pl. 80. *Wilkes Eng. Moths*, pl. 49. *Phragmatobia fuliginosa*, *Stephens*. *Duncan Brit. Moths*, pl. 20. fig. 3.

*Upper Side.* The head is small ; the thorax and superior wings are of a red brown. The inferior are crimson or deep rose colour, having an irregular border of black along the fan edge, and a small black speck in the centre of the wing. The abdomen is also red, having a black speck on each annulus.

The *under side* is somewhat paler.

The caterpillar feeds on banks, on various herbage ; is taken in May, full fed as at (*i*) ; changes to chrysalis in a spinning, as at (*k*), and the moth is figured at (*m*). This insect continues during the winter in the caterpillar state. The chrysalis is seen at (*l*).

Expansion of the wings 1—1½ inch.

#### HIPPARCHIA MEGÆRA. THE WALL [OR GREAT ARGUS] BUTTERFLY.

Plate XXVII. fig. *a*—*g*.

SYNONYMS. *Papilio (Nymph. Gemm.) Megera*, *Linn. Syst. Nat.* ii. 774. *Lewin's Papil.* pl. 21. *Donov. Brit. Ins.* vol. viii. pl. 279. ♂. *Papilio Nymph. Mægera*. *Haworth*. *Hipparchia Megæra*, *Stephens*, *Ochsenheimer*, *Curtis*. *Duncan Brit. Butt.* pl. 22. fig. 3. *Papilio Mæra*, *Berkenhout*. *Wilkes' Eng. Moths & Butt.* pl. 102. (The Great Argus.) *Harris, 1st edit.* (The Wall.) *Papilio Oculatus*, etc. (The London Eye.) *Petiv. Pap.* pl. 5. fig. 8. ♂.

*Upper Side.* The head, thorax, and abdomen are of a dark brown. The superior wings are of a pleasant brownish yellow, having a round black spot near the apex on the fourth fan membrane, like the eye of a bird, with a small white speck in the middle : between this speck and the thorax are two irregular dark bars, about a quarter of an inch asunder, and another nearer the thorax very short. The inferior wings are in colour and marking similar to the superior, having four spots or eyes near the border, similar to that in the superior wing, see the fig. at (*f*). The above description is taken from a female, the under side of which is seen at (*e*). The male differs from the female, in having a dark cloud in the middle of the superior wing.

The caterpillar feeds on grass, and is full fed about the middle of July, when it appears as at (*a*). It then hangs itself up perpendicular by the tail, as at (*b*) ; and changes into the chrysalis seen at (*c*) and (*d*). The fly appears about the beginning of August. There are two broods in summer of this insect, one at the end of May, the other in August.

Expansion of the wings 1½—2 inches.

This is one of our most abundant butterflies ; frequenting grassy lanes, woods, and way-sides.

## ENNYCHIA OCTOMACULATA. THE WHITE SPOT MOTH.

Plate XXVII. fig. *p*.

SYNONYMS. *Geometra Octomaculata*, *Linn. Mantissa*, 540.  
*Phalæna Atralis*, *Fabricius*. *Donov. Brit. Ins.* vol. viii. pl. 266. fig. 4.  
*Ennychia Octomaculata*, *Treitschke*.  
*Anania Octomaculata*, *Hubner*, *Stephens*.

*Upper Side.* The antennæ are like hairs. The whole moth is black, having ten white spots variously situated, one on each side the thorax, and two on each wing. They are found in woods in May, but the natural history has not hitherto been discovered.

Expansion of the wings three-quarters of an inch.

## NEMEOBIUS LUCINA. THE DUKE OF BURGUNDY FRITILLARY BUTTERFLY.

Plate XXVII. fig. *n—o*.

SYNONYMS. *Papilio* (*Nymph. Phal.*) *Lucina*. *Linn. Syst. Nat.* ii. 784. *Lewin Papil.* pl. 15. fig. 5. 6.  
*Donovan Brit. Ins.* pl. 242. fig. 2. *Haworth*.  
*Nemeobius Lucina*, *Stephens Illust. Haust.* 1. 29. *Duncan Brit. Butt.* pl. 12. fig. 1.  
*Boisduval Hist. Nat. Ins. Lep.* vol. i. pl. 3. a. fig. 3. *Larva & Pupa*. pl. 2. b.  
fig. 8. *imago*.  
*Hamelaris Lucina*, *Hubner*. *Curtis Brit. Ent.* pl. 316.

*Upper Side.* This is the smallest of all the fritillaries, and is one of those which want the silver spots. The whole fly is dark brown, having a number of spots of an orange colour in various parts of the wings.

The *under side* of the superior wings is paler, having some black spots near the middle. The inferior wings are dark brown, having two rows of pale yellow arch-like spots crossing the wing. The fan edges of all the wings, both on the upper and under side, are bordered with light spots, each like the gothic arch, having a bright speck in the centre of each. They fly in May, in woods. Their natural history had not been discovered in Harris' time. The upper side is seen at (*n*), and the under at (*o*).

Expansion of the wings 1 to  $1\frac{1}{3}$  inch.

This insect is an exceedingly interesting species as regards the classification of the diurnal Lepidoptera or butterflies, the colours and markings of the wings especially indicating a close relation between it and the other Fritillaries; but its caterpillar is onisciform, resembling a wood-louse; and its chrysalis is short and obtuse, and girt round the middle as well as attached by the tail, as in the Lycaenidæ, whereas that of the other species of Fritillaries is simply suspended by the tail. The fore legs of the males alone are rendered useless from their minute size, those of the female being of the ordinary size; in this respect the insect agrees with the character of the Erycinides, and it is in this tribe that it is accordingly placed by Boisduval. The caterpillar figured by Hubner is of a pale olive-brown colour, with a large black dot on each segment, and with the head and legs dusky red. It feeds on different species of Primula. The perfect insect is not rare in the south of England, but has not been found so far north as Scotland.





To Lady Bicklin  
her Ladyships most Obedient  
Servt Moses Harris

This Plate is Humbly Dedicated by  
Servt Moses Harris

M. Harris ad Verum

## MELITÆA ARTEMIS. THE GREASY FRITILLARY BUTTERFLY.

Plate XXVIII. fig. *e*—*i*.

SYNONYMS. *Papilio Artemis*, *Fabricius*. *Lewin Pap.* pl. 15. *Haworth Lep. Brit.* pl. p. 36.  
*Melitea Artemis*, *Ochsenheimer*, *Stephens*. *Duncan Brit. Butt.* pl. 13. fig. 2.  
*Papilio Matura*, *Esper. Pap.* 1. pl. 16.  
The Small Fritillary Butterfly, *P. Lucina*, *Wilkes*, pl. 114.

*Upper Side.* The head, thorax, and abdomen are dark brown. The superior and inferior wings are of a brown orange colour, mottled with black and yellow. The inferior having a border of yellow along the fan edges, composed of eight yellow spots.

The *under side* of the superior wings is a faint appearance of the upper side; and being bare or almost naked of plumage, seems as if greasy. I have shewn the male at (*i*), the female at (*g*), and the under side of the female at (*h*).

The caterpillars are seen in their last skin the latter end of April, when they appear as at (*e*)(*e*). The preparation which each makes for its preservation in the chrysalis state is greatly to be admired: when ready for its change, its first business is to draw several pieces or blades of grass across each other, toward the top: these it fastens together with its web; then beneath the centre, where the blades of grass intersect each other, it hangs itself by the tail, and undergoes its change as represented at (*f*), where an exact drawing of the chrysalis is seen: it is white, having a number of black spots and marks; the head and tip of the tail is yellow. The time for taking the fly is the middle of May.

Expansion of the wings  $1\frac{1}{3}$  to  $1\frac{11}{12}$  inch.

This insect is more particularly found in the southern counties of England, occurring but very rarely in the north. The caterpillars feed on the two common species of plantain, and on the devil's-bit scabious, (*Scabiosa succisa*). Like those of *M. cinxia* the caterpillars are produced in the autumn, and the young brood keeps together under a web, in which it passes the winter.

Two extraordinary varieties of this insect are figured by Mr. Dale in the Magazine of Natural History, in one of which almost all the pale spots of the upper side of the wings are obliterated.

## ARGYNNIS ADIPPE. THE HIGH BROWN FRITILLARY BUTTERFLY.

Plate XXVIII. fig. *a*—*d*.

SYNONYMS. *Papilio (N. Ph.) Adippe*, *Linn. Syst. Nat.* ii. 786. *Lewin Papil.* pl. 10. *Donovan Brit. Ins.* vol. xiii. pl. 448.  
*Argynnis Adippe*, *Ochsenheimer*, *Leach*, *Stephens*. *Duncan Brit. Butt.* pl. 16. fig. 1.

*Upper Side.* The head, thorax, and abdomen are dark brown. The superior and inferior wings are of a brown orange, spotted with black. All the fan edges are bordered with a black double line, within which is a scolloped one, forming arches, like a bridge.

The *under side* of the superior wings is similar to the upper, except the apex of the wing, which is yellow. The inferior wings are yellow, spotted with twenty-four silver spots.

The caterpillar is figured at (a), and the chrysalis at (b). The caterpillar lies during the winter in that state; changes to the chrysalis the end of May: the fly appears the middle of June.

Expansion of the wings  $2\frac{1}{2}$  to  $2\frac{3}{4}$  inches.

This insect is rarer than *A. Aglaia*, but is found occasionally in many of the southern parts of England. It flies at the end of June and beginning of July; frequenting heaths and the borders of woods. The caterpillar is described as fine red or olive green (afterwards), with a white line down the back edged with black dots. It feeds upon several species of violet.

#### ANAITIS PLAGIATA. THE TREBLE BARRED MOTH.

Plate XXVIII. fig. *k*.

SYNONYMS. *Phalæna (Geometra) Plagiata*, *Linn. Syst. Nat.* ii. 869.  
*Phalæna Duplicata*, *Fabricius. Donovan Brit. Ins.* vol. vii. pl. 233. fig. 2.  
*Anaitis Plagiata*, *Duponchel. Stephens.*

*Upper Side.* The antennæ are like hairs. The head and thorax are of an ash colour; as are the superior wings; the latter having each three bars, crossing the wing, from the sector to the slip edges: each of these bars is composed of three lines, except that nearest the shoulder, which is composed only of two. The inferior wings are of a pale brown, and plain.

The *under side* is pale brown. It is taken the end of May, in the morning, just after sunrise. It is figured in the plate at (*k*).

Expansion of the wings one inch and a half.

#### VENILIA MACULARIA. THE SPECKLED YELLOW MOTH.

Plate XXVIII. fig. *m*.

SYNONYMS. *Phalæna (Geometra) Macularia*, *Linn. Syst. Nat.* ii. p. 862.  
*Geometra Maculata*, *Wien. Verz. Donovan Brit. Ins.* vol. vii. pl. 251. fig. 3.  
*Venilia Macularia*, *Duponchel. Curtis. Stephens.*

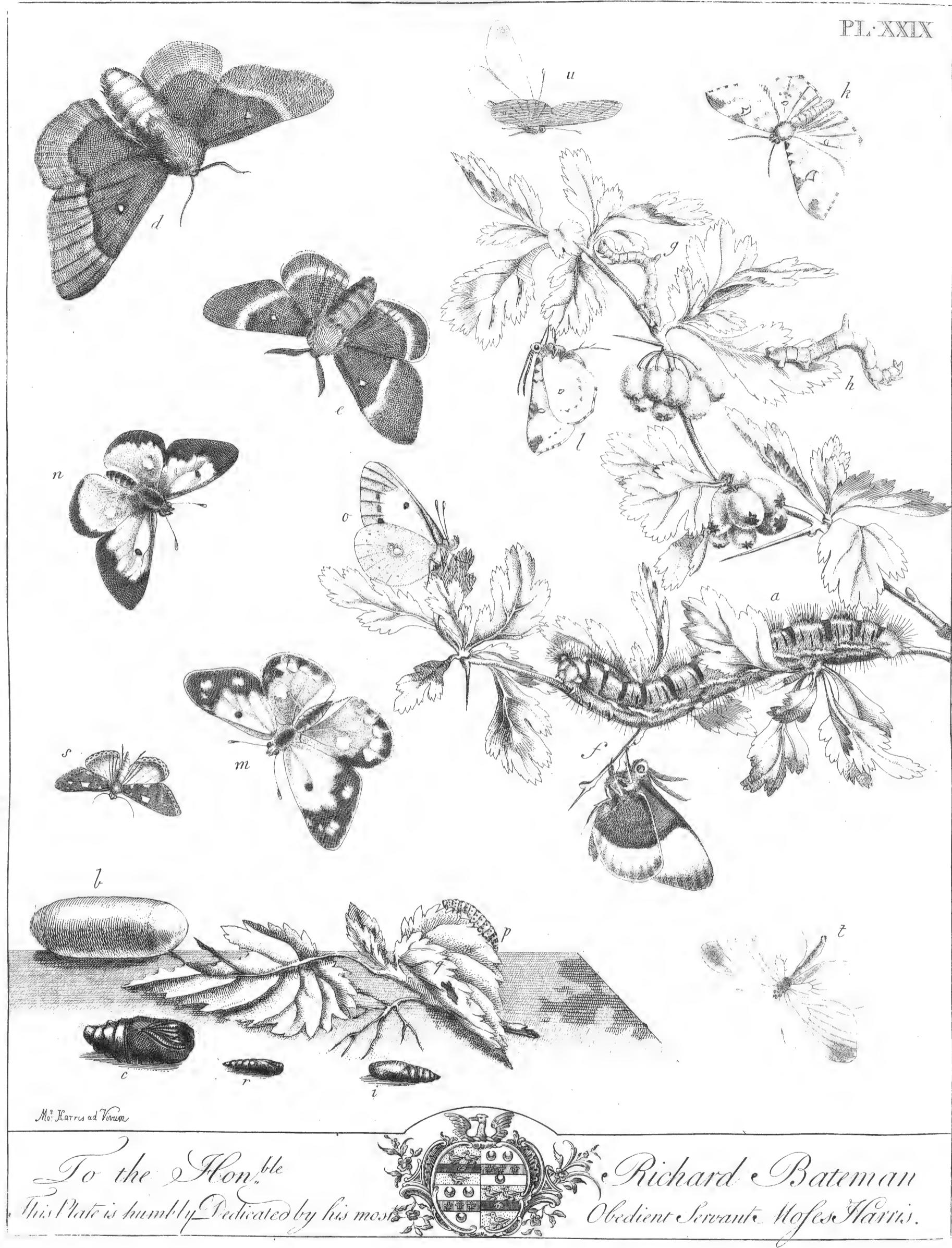
*Upper Side.* The antennæ are small, and thread-like. This moth is totally yellow, both on the under and upper side: it is also covered with pretty large spots on both sides of the wings. On the upper side the spots on the superior wings are brown, but those on the inferior are black.

On the *under side* it is the reverse; the spots on the superior being black, while those on the inferior are brown.

This moth is taken about the middle of May, in woods. The caterpillar has never been discovered. The moth is figured at (*m*).

Expansion of the wings  $1\frac{1}{2}$  inch.





## PYRAUSTA PURPURALIS. THE CRIMSON AND GOLD MOTH.

Plate XXVIII. fig. *l*.

SYNONYMS. *Phalaena* (*Pyralis*) *Purpuralis*, *Linn. Syst. Nat.* ii. p. 883. *Donov. Brit. Ins.* x. pl. 339. f. 2.  
*Pyrausta Purpuralis*, *Stephens*, *Curtis*.

*Upper Side.* The antennæ are like fine hairs. The head, thorax, and superior wings are of a deep crimson: the latter bordered and spotted with gold colour. The inferior wings are black, fringed with yellow; a bar of the same colour crossing each wing, parallel to the fan edge; above which is a small yellow speck. It is shewn in the plate at (*l*). They are taken in May, among nettles.

Expansion of the wings three-quarters of an inch.

## LASIOCAMPA QUERCUS. THE GREAT EGGER MOTH.

Plate XXIX. fig. *a—f*.

SYNONYMS. *Phalaena* (*Bombyx*) *Quercus*, *Linn. Syst. Nat.* ii. p. 814. *Donovan Brit. Ins.* iii. pl. 104.  
fig. 1. 2. *Albin's Ins.* pl. 18. *Wilkes' Eng. Moths*, pl. 46.  
*Lasiocampa Quercus*. *Schrantz*. *Duncan Brit. Moths*, pl. 17. fig. 3.  
*Lasiocampa Roboris*, *Schrantz?* *Stephens?*

*Upper Side.* The antennæ are brown and pectinated. The thorax and abdomen are of a deep fox colour. The wings are also of a fox colour, having a bar crossing each, of a dark gold colour; between each and the shoulder, in the superior wings, is a strong white spot.

The *under side* has half the wings toward the body of a dark red brown; the outer parts are of a dark gold colour. The female moth has much the same markings, but the colours are generally paler. The male is shewn at (*e*), displaying the upper side; and the under side is seen at (*f*). The upper side of the female is shewn at (*d*).

The caterpillar, seen at (*a*), feeds on the white-thorn, and is in that state during the winter season. About the middle of May it spins itself up in a brown case, and changes into chrysalis, as at (*b*) and (*c*); and the moths appear the middle of June. They are generally taken by sembling: the manner is to go out with a live female in a box, covered over with gauze, and having arrived at a convenient place, such as a lane, near woods, &c. there set it down on the ground, and be prepared with the nets, as the males, smelling the female, will quickly be flying about the box. Not only this, but any of the other species of *Phalena* may be taken by sembling, provided the female insect be tied round the middle with a piece of sewing thread, and fastened to some place near where there is a brood.

Expansion of the wings  $2\frac{1}{4}$ — $3\frac{1}{4}$  inches.

Many curious instances of the property mentioned above under the name of *sembling* are recorded in various works, from which it appears by no means clear as to the means whereby the males obtain intelligence of the presence of their partners—often at very great distances, and in situations apparently inaccessible to them. Mr. Haworth mentions an instance in which a male of this insect found its way into the pocket of a collector, who happened to have a female in his collecting box; and Mr. Davis mentions another instance in which a male actually came down a chimney. (*Mag. Nat. Hist.* No. 4.)

## RUMIA CRATÆGATA. THE BRIMSTONE MOTH.

Plate XXIX. fig. *g*—*l*.

SYNONYMS. *Phalæna (Geometra) Cratægata*, *Linn. Syst. Nat. ii. 868.* *Albin's Insects*, pl. 40. fig. 65.  
*e—h.* pl. 46. fig. 76. fig. 77. *a—e.* pl. 95. fig. *e—h.* *Wilkes' Eng. Moths*, pl. 80.  
*Rumia Cratægata*, *Duponchel, Stephens. Duncan Brit. Moths*, pl. 27. fig. 1.

*Upper Side.* The whole moth is of a fine yellow colour. In the centre of each wing is a triangular spot of white. On the sector edge are placed five triangular spots of a dark red colour, of which the first three next the shoulder are small and pretty close together. The inferior wings have an obtuse angle about the middle part of the fan edge.

The caterpillar feeds on white-thorn, and is remarkable for a protuberance on the middle of the back, which sometimes is divided, and appears like two, as at (*g*) and (*h*). It changes into chrysalis in September, and the moth appears toward the end of May. The chrysalis is seen at (*i*). The upper side of the moth is shewn at (*k*), and the under at (*l*).

Expansion of the wings one inch and a half.

## COLIAS ELECTRA. THE CLOUDED YELLOW BUTTERFLY.

Plate XXIX. fig. *m*—*o*.

SYNONYMS. *Papilio (Dan. Cand.) Electra*, *Linn. Syst. Nat. ii. 764.* *Lewin's Pap.* pl. 32.  
*Papilio Edusa, Fabricius, Haworth. Donovan Nat. Hist. Brit. Ins. 7. pl. 238.* Female.  
*Papilio Hyale, Wien. Verz., Esper Schmett*, 1. pl. 4. fig. 3. *Donovan op. cit. 2. pl. 43.*  
*fig. sup. Male.*  
*Colias Edusa, Stephens, Curtis. Duncan Brit. Butt.* pl. 5. fig. 2.

*Upper Side.* The antennæ are short; the head, thorax, and abdomen are of a brownish yellow. The superior wings are of a yellow orange, having a cloud of black covering the fan membranes for near half an inch in width, in which are placed three yellow spots, not seen in the male; near the centre of the wing, just on the bar tendon, is a black spot. The inferior wings are more of a dusky yellow, clouded on the fan edges, with black in the middle of the wing: on the bar tendon is a large red spot. The female is seen at (*m*), shewing the upper side of her wings. The male shews its upper side at (*n*), and the under side at (*o*).

The *under side* of the superior wings is yellow, having a broad border on the fan edges of dark dusky yellow, and a black spot on the bar tendon. The inferior wings are of the same dusky yellow, having two small flesh-coloured spots on the bar tendon. They fly in meadows, and appear in August. They are fond of settling on yellow lupins and thistles. They have been taken in plenty on Epping Forest. They fly in the morning and afternoon, but never in the middle of the day.

Expansion of the wings  $1\frac{3}{4}$ — $2\frac{1}{2}$  inches.

The possession of the Linnaean cabinet of insects by the Linnaean Society of London has enabled Mr. Newman to determine that this insect is the *Papilio Electra* of that author,\* (under which name indeed it had been long ago figured by Lewin). It is more usually known, however, under the specific name of *Edusa* of Fabricius; but I have thought it more correct to refer to the prior name *Electra*.

\* It is to be observed, however, that Linnaeus gives the Cape of Good Hope as the habitat of his *P. Electra*, and that Boisduval has described an African insect under that name distinct from the European *P. Edusa*.

The caterpillar, which is naked, cylindrical and slightly villose, is deep green with a longitudinal white stripe on each side marked with yellow spots and minute bluish dots ; it feeds upon *Cytisus austriacus* on the continent, but as that is not a British plant, it probably feeds upon *Medicago lupulina* or other papilionaceous plants in this country. Boisduval indeed states that its food consists of the *Medicago*, *Trifolium*, and other leguminous plants.

This insect frequents the blossom of lucerne in preference to that of any other plant, at the end of August. It is not rare in the southern part of England, especially preferring the sea coast, as Dover, Brighton, the back of the Isle of Wight, and the Channel islands, although occasionally found plentifully near London. Boisduval gives Europe, Egypt, the coast of Barbary,—Nepaul, Cachemire, Siberia, and North America, as the range of this species. Mr. Kirby has also described it in his *Fauna Boreali-Americanana*, but has pointed out some distinctions between the American and European individuals.

This is one of those insects whose periodical appearance in certain but indeterminate years has so much perplexed entomologists. The other species of this genus, as well as *Cynthia Cardui* and *Vanessa Antiopa*, are subject to this irregularity,—*Colias Electra* being supposed to occur every three or five years, whilst *V. Antiopa* will not be seen for eight, ten or more years, and then appear as plentiful as before. Mr. Haworth conjectured this might be owing to the eggs having, like the seeds of plants, lain dormant, not hatching until some extraordinary but undiscovered coincidences awaken them into active life ; others attribute it to the failure of their natural enemies, as the Ichneumons and soft-billed birds ; and others to an increased temperature. But these are mere conjectures, and seem to want confirmation, from the circumstance noticed by Stephens that *Cynthia Cardui*, although periodical in some places (occurring every third or fourth year) most copiously, and breeding even in the metropolis itself, appears constantly in others. Mr. Bree observes that experience shows that this periodical appearance does not depend on the warmth and fineness of the summer, nor on the mildness of the preceding winter, nor can it be satisfactorily attributed to any known cause ; neither do the peculiar circumstances which conduce to the appearance of *C. Electra*, have the same effect upon the other species, *C. Hyale* ;—Mr. Bree stating that whilst, in 1831, *C. Electra* was abundant near Dover, only one of *C. Hyale* was taken ; and that in 1832 and 1833, in which so many specimens of *C. Hyale* were met with, the other was scarcely seen at all. (*Mag. Nat. Hist. May*, 1836, p. 262.)

The varieties of this insect have been regarded as distinct species by some writers ; Mr. Bree, however, whose practical acquaintance with the species of butterflies cannot be doubted, as well as Mr. Curtis and others, regard them as belonging to but one species. The variety named *Helice* by Mr. Haworth, is figured by Stephens, *Illustrations*, pl. 11.\* fig. 3. ♀ and by Mr. Bree, *Mag. Nat. Hist.* No. 26. Mr. Blyth has also made some observations on this species and its varieties, in the 41st No. of the same work. The latter gentleman has given, in the same work, a curious instance of the attachment of a number of specimens of this insect to a particular spot, even when driven from it, although he considers it ordinarily to be one of the most rambling and restless of our British butterflies.

## SCOPULA OLIVALIS. THE CHINA MARK LIKENESS MOTH.

Plate XXIX. fig. *p-s.*

SYNONYMS. *Botys Olivalis*, *Wien. Verz.*  
*Scopula Olivalis*, *Stephens*, *Curtis*.  
*Phalæna Nivealis*, *Fabricius*, *Haworth*. *Stephens Cat.*

*Upper Side.* The antennæ are like fine threads. The superior wings are of a dirty brown, having some light markings thereon, particularly a square white spot in the middle of the wing. The inferior wings are of an ash colour, having a dotted border.

Its caterpillar feeds on the nettle, and when it is full fed appears as at (*p*). It changes to the chrysalis the beginning of May, spun up in the nettle leaf, as at (*q*): (*r*) shews the chrysalis, and the moth appears in three weeks.

Expansion of the wings one inch.

## LEUCOPHASIA SINAPIS. THE WOOD WHITE BUTTERFLY.

Plate XXIX. fig. *t-u.*

SYNONYMS. *Papilio* (Dan. Cand.) *Sinapis*, *Linn. Syst. Nat.* ii. p. 760. *Lewin's Papil.* pl. 29. fig. 4. 5.  
*Donovan Brit. Ins.* vol. viii. pl. 280. 2. ♂.  
*Leucophasia Sinapis*, *Stephens Illustr. Haustell. Ins.* vol. i. p. 24. *Duncan Brit. Butt.*  
pl. 10. fig. 3. *Boisduval Hist. Nat. Lep.* vol. 1. p. 429.

*Upper Side.* The head, thorax, and abdomen are black. The superior wings are white; the apices are of a darkish grey. The inferior wings are also white, having a few darkish clouds, scarcely visible. They fly in woods in May and August. It is remarkable that this fly is seldom seen to settle. I suppose I have seen hundreds, but never yet saw one settled.

Expansion of the wings  $1\frac{1}{3}$ — $1\frac{3}{4}$  inches.

This is the smallest of the British white butterflies, and is easily distinguished from all the rest by its narrower wings and long narrow body; it is by no means a common species, although it has been found in certain situations plentifully. The caterpillar, which is cylindric, downy, and green, with a deep yellow lateral line, feeds upon the Bird's-foot trefoil (*Lotus corniculatus*) and meadow vetchling (*Lathyrus pratensis*), *Vicia cracca*, and *Orobus*. The chrysalis is spindle-shaped and curved; it is attached by the tail, as well as by a transverse girth round the middle of the body. Mr. Newman observes upon this insect—"The propensity which insects evince to fly in one direction is truly remarkable: in the roads through the woods of Kent I have found that the readiest way to take it is to stand quietly and allow them to come to me; they are slow and very easily captured, and after having observed the direction in which one is proceeding, I could always make sure of many more following in the same track; when I have attempted to turn them back it has been of no avail, they have passed on one side or over me, and quietly pursued their course: these roads are cut through the woods in every direction of the compass, and I found the way of the wind had little or nothing to do with the matter, as in some instances their flight was with the wind, and in others directly against it." (*Entomol. Mag.* v. I. p. 319.)





## EPISEMA CERULEOCEPHALA. THE FIGURE OF EIGHT MOTH.

Plate XXX. fig. *a—d*.

SYNONYMS. *Phalæna (Bombyx) Cœruleophala, Linn. Syst. Nat. ii. p. 826. Donovan Brit. Ins. 3. pl. 100. Haworth. Wilkes' Eng. Moths, pl. 12. (Black-thorn Moth.)*

*Upper Side.* The antennæ of the male are pectinated. The head, thorax, and superior wings are brown: the latter having some markings about the middle part, representing two figures of eight close together. The inferior wings are of a light hair colour, having a darkish bar crossing the middle part.

The caterpillars feed on black-thorn, white-thorn, and crab-tree. When full fed, as represented at (*a*), which generally happens about the beginning of June, they change into chrysalis within a pretty hard case, shewn at (*b*). The moth appears in August. It is shewn in the plate at (*c*) and (*d*).

Expansion of the wings  $1\frac{1}{4}$ — $1\frac{1}{2}$  inches.

## LIMENITIS CAMILLA. THE WHITE ADMIRABLE, OR WHITE ADMIRAL BUTTERFLY.

Plate XXX. fig. *m—n*.

SYNONYMS. *Papilio (Nymph. Phal.) Camilla, Linn. Syst. Nat. ii. p. 781. Lewin's Papil. pl. 8. Donovan Brit. Ins. vol. viii. pl. 244. Wilkes' Eng. Moths & Butt. pl. 1. fig. 7. pl. 8. fig. 1. Limenitis Camilla, Fabricius, Leach, Stephens. Curtis Brit. Ent. pl. 124. Duncan Brit. Butt. pl. 20. fig. 2. Papilio Sibilla, Fabr. Ent. Syst. iii. 246.*

*Upper Side.* The antennæ are black, the knobs tipped with brown. The body and wings are black, having a broad interrupted bar or garter of white, which, crossing both upper and under wings, almost meets at the abdominal corner, where are two small circles of an orange colour.

The *under side* is of a lively orange brown, except that part of the inferior wings which is included between the broad white garter and the thorax, which is of an ash colour; for the same broad white garter appears on this side exactly as on the other. They fly in woods, and may be taken the end of June. I have figured the upper side at (*m*), and the under at (*n*).

Expansion of the wings  $2$ — $2\frac{1}{2}$  inches.

The caterpillar of this butterfly differs materially from those of the genera *Cynthia*, *Vanessa*, and *Apatura*, in being furnished with obtuse spines on the back and bundles of hair on the sides. It is of a green colour, with the head, legs, and tubercles on the back reddish, and feeds on the various species of honeysuckle; the chrysalis is green, spotted with gold, and forked in front. The butterfly itself delights to settle on bramble blossoms. It is by no means common, and is certainly very local, occurring in the south-eastern counties of England. "The graceful elegance displayed by this charming species," observes Mr. Haworth, "when sailing on the wing, is greater perhaps than can be found in any other we have in Britain. There was an old aurelian of London, so highly delighted at the inimitable flight of Camilla that, long after he was unable to pursue her, he used to go to the

woods, and sit down on a stile, for the purpose of feasting his eyes with her fascinating evolutions—

— “ When swift Camilla scours the plain,  
Flies o'er the unbending corn, and skims along the main.”  
POPE.

The Rev. W. T. Bree has described a remarkable variety of this insect in the Mag. of Natural History, Vol. 5, p. 667, taken near Colchester, in which the wings above are entirely of a sooty black colour, and destitute of the white marking ; a few lighter spots being visible here and there, just serving to trace out very faintly the mere rudiments, as it were, of the ordinary white spots.

“ Unlike the Purple Emperor, it seems” (says the Rev. Revett Sheppard, in Miss Jermyn’s Butterfly Collector’s Vade Mecum, 2nd Ed. p. 121) “ to avoid the sunbeams ; for it frequents the glades of woods, where it rapidly insinuates itself, by the most beautiful evolutions and placid flight, through the tall underwood on each side of the glades, appearing and disappearing like so many little fairies.”

#### MINOA CHÆROPHYLLATA. THE CHIMNEY SWEEPER MOTH.

Plate XXX. fig. o.

SYNONYMS. *Phalæna* (Geom.) *Chærophylata*, *Linn. Syst. Nat.* ii. 886. *Donov. Brit. Ins.* vol. vii.  
pl. 253. fig. 4.  
*Phalæna Atrata*, *Linn. Faun. Suec.* no. 1274.  
*Minoa Chærophylata*, *Treitschke*, *Stephens*.

The antennæ are like threads. This moth is totally black, except the apices of the superior wings, which are white. It flies in woods the beginning of June. It is figured in the Plate at (o). I believe it has never been described before.

Expansion of the wings one inch.

This is a very common species in woods and heathy places, especially where ferns abound.

#### CALLIMORPHA MINIATA. THE RED ARCHES MOTH.

Plate XXX. fig. p.

SYNONYMS. *Phalæna* (Geom.) *Miniata*, *Forster Centur.* i. 75.  
*Phalæna Rosea*, *Fabricius*. *Donovan Brit. Ins.* 2. pl. 40. fig. inf.  
*Callimorpha Miniata*, *Stephens*.

*Upper Side.* The antennæ are like fine threads. The head and thorax are of a lively red. The superior wings are of the same colour, having two neat black lines, which cross them. The outer one, by which I mean that which is near the fan edges, runs with a pretty serpentine motion, like a rivulet. The abdomen and inferior wings are of a pale orange. The natural history of this phalena is, I believe, entirely unknown. It is taken by beating the oaks, the beginning of July.

Expansion of the wings 10—16 lines.

## PTEROPHORUS PTERODACTYLUS. THE BROWN PLUMED MOTH.

Plate XXX. fig. *i*—*l*.

SYNONYMS. *Phalæna Alucita Pterodactyla*, *Linn. Syst. Nat.* ii. 900. *Haworth.*  
*Pterophorus Pterodactylus*, *Fabricius, Curtis, Stephens.*  
*Phalæna (Alucita) Tridactyla*, *Harris, 1st. edit.* (sed nec *Linn.*)

*Upper Side.* The antennæ are like threads. It is totally of a light brown colour. The superior wings are very narrow, and cleft at the ends. The inferior wings are composed of three feather-like appendages.

The caterpillars feed on thistles; and when full fed, as at (*n*), fix themselves by the tail to a piece of stick, &c. with the head part erect or upward; and change into chrysalis, which is figured at (*h*). This happens the beginning of August, and the moth appears in about twelve days. A remarkable circumstance attends this chrysalis, that when touched or annoyed by any thing it will suddenly spring backward, reversing its position, and remain a short time with its head downward; but as suddenly revert to its former position. The moth is shewn at (*h*).

Expansion of the wings one inch.

## HYLOPHILA QUERCANA. THE SCARCE GREEN SILVER LINES MOTH.

Plate XXXX. fig. *e*—*h*.

SYNONYMS. *Tortrix Quercana*, *Wien. Verz. Hubner.*  
*Chloephora Quercana*, *Stephens (Illustr.)*  
*Halias Quercana*, *Curtis Brit. Entomol.* pl. 575.  
*Hylophila Quercana*, *Hubner.*  
*Tortrix Prasinana*, *Haworth. Fabricius (Pyralis p.) Donov. Brit. Ins.* 2. pl. 40. fig. sup.?  
*Chloephora Prasinana*, *Stephens (Cat.)*

*Upper Side.* The antennæ are like threads. The head and thorax are green. The superior wings are green also; they have two neat lines of a pale straw colour, crossing each diagonally. The abdomen and inferior wings are white.

The *under side* is of a pale greenish white. The legs are red. All the wings are a little angulated.

The caterpillar is taken by beating the boughs of oak trees, at the same time spreading a sheet to catch what falls from the tree. It is full fed the end of May, when it appears as at (*e*). It changes into chrysalis within a pretty strong case, seen at (*f*); and the moth is produced the end of June. The chrysalis is white, as at (*g*), having a strong black mark down the back part. The moth is figured at (*h*).

Expansion of the wings one inch and a quarter.

This moth is very closely allied to, and has been greatly confounded with, *Ch. prasinana* figured in pl. 10.

## HYPENA PROBOSCIDALIS. THE SNOUT EGGER LIKENESS MOTH.

Plate XXX. fig. *f*—*h*.

SYNONYMS. *Phalæna (Pyralis) Proboscidalis*, *Linn. Syst. Nat.* ii. p. 881. *Leach.*  
*Hypena Proboscidalis*, *Schrank, Ochsenheimer, Curtis, Stephens.*  
*Pyralis Proboscidalis*, *Hubner.*

*Upper Side.* The antennæ are like threads. The palpi are remarkably long; at least one-eighth of an inch. The superior wings are of a fine brown; having a broad band crossing the middle of each, and a few small white specks in a line with each other on the fan membranes. The inferior wings are much paler than the superior: it is shewn at (h).

The caterpillar feeds on nettles; and is full fed the beginning of May, appearing as at (a). It changes into chrysalis, in a slight web, on the ground. The moth appears in three weeks. The chrysalis is seen at (g).

Expansion of the wings one inch and a quarter.

#### MELITÆA SELENE. THE SMALL PEARL BORDERED FRITILLARY BUTTERFLY.

Plate XXXI. fig. i, k.

SYNONYMS. *Papilio Selene*, *Fabr. Ent. Syst.* 3. part a. p. 147.  
*Melitæa Selene*, *Stephens. Curtis Brit. Ent.* pl. 386.  
*Papilio Silene*, *Haworth Lep. Brit.* p. 34.  
*Melitæa Silene*, *Leach, Samouelle, Jermyn. Duncan Brit. Butt.* pl. 13. fig. 3.  
*Papilio Euphrasia*, *Lewin's Papil.* pl. 13.  
*The April Fritillary, Ray, Petiver.*

*Upper Side.* It is totally of a light brown orange, spotted with black. The under side of the superior wings is similar to the upper side, but paler. The inferior wings are of a dark red-brown; have a border along the fan edges, consisting of seven silver-like spots, and about twelve more dispersed over the wing. It is represented at (i) and (k). It is found in plenty in woods, the latter end of May.

Expansion of the wings 1 $\frac{2}{3}$ —2 inches.

The caterpillar is black with a clear lateral stripe, the spines are partly yellow. The butterfly is common on heaths and in woods throughout the south of England.

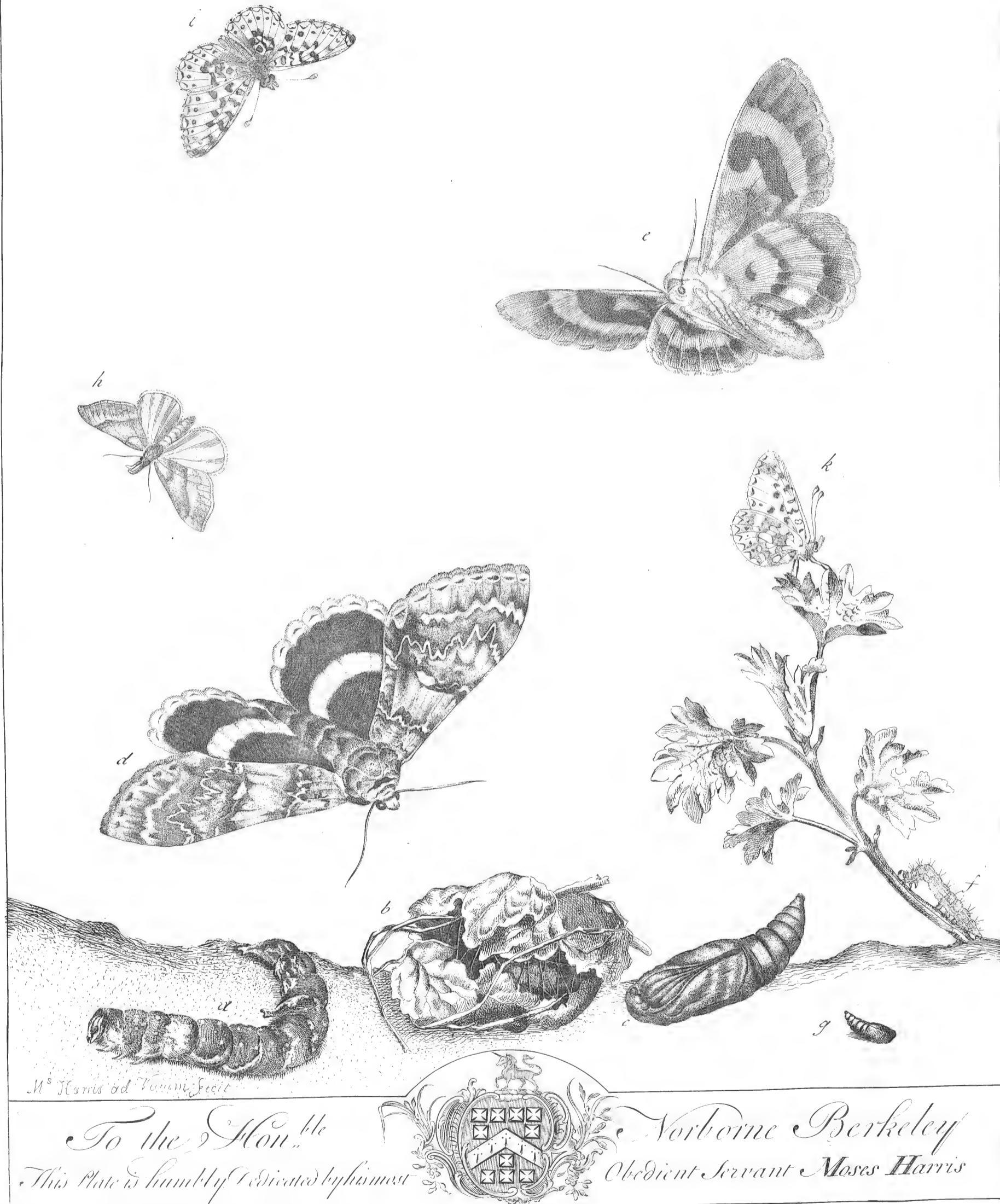
#### CATOCALA FRAXINI. THE CLIFDEN NONPAREIL MOTH.

Plate XXXI. fig. a—e.

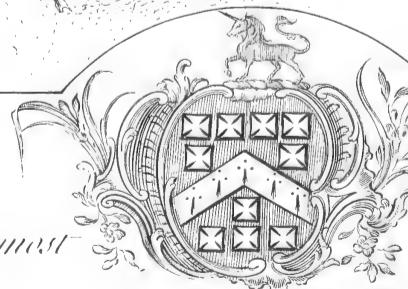
SYNONYMS. *Phalæna (Noctua) Fraxini*, *Linn. Syst. Nat.* ii. 843. *Donovan Brit. Ins.* v. pl. 171.  
172. *Wilkes' Eng. Moths*, pl. 90.  
*Catocala Fraxini*, *Schrantz, Ochsenheimer, Curtis. Duncan Brit. Moths*, pl. 26. fig. 1.

*Upper Side.* The antennæ are like strong threads. The thorax and head are brown, and beautifully crested. The abdomen is also brown and crested. The superior wings are of a light brown, beautifully waved, and mottled with undulated clouds. The fan edges are scolloped. The inferior wings are black, having a broad blue garter crossing the middle of each. The fan edges are scolloped, along which is also a broad white border, having seven little black spots, one on each membrane.

The *under side* is of a dirty cream colour, having many black cloud-like bands crossing the wings, as shewn at (e). The upper side is seen at (d); the caterpillar at (a), spinning at (b); and the caterpillar is copied from the excellent works of Mr. Ammiral; the truth of whose drawings I should do him great injustice to doubt of. The first of these moths known to be taken



To the Honble  
This Plate is humbly Dedicated by his most



Norborne Berkeley  
Obedient Servant Moses Harris



in England, was at Clifden in Buckinghamshire, in July. It was taken hanging against the pedestal of a statue, having just come out of chrysalis, and was drying its wings.

Expansion of the wings four inches.

This fine moth still continues to be extremely rare ; although individuals occur from time to time in different parts of the country.

#### HIPPARCHIA JANIRA. THE MEADOW BROWN BUTTERFLY.

Plate XXXII. fig. *a—e*.

**SYNONYMS.** Papilio (Nymph. Gemm.) Janira, *Linn. Syst. Nat.* ii. 1053. (♂)  
 Papilio (Nymph. Gemm.) Jurtina, *Linn. Syst. Nat.* ii. 1052. (♀) *Lewin's Papil.* pl. 18.  
*Donov. Brit. Ins.* vol. ix. pl. 320. *Haworth.*  
*Hipparchia Janira, Ochsen., Leach, Curtis, Stephens. Duncan Brit. Butt.* pl. 24. fig. 1. 2.  
 The Meadow-brown. Papilio Hyperanthus, *Wilkes' Eng. Moths & Butt.* pl. 101. *Albin's  
 Ins.* pl. 53. fig. *a—e*.  
 Papilio Pratensis Oculatus Fuscus, Brown Meadow Eye, *Petiv. Papil.* pl. v. f. 10. ♂.  
 Papilio Pratensis Oculatus Aureus, Golden Meadow Eye, *Petiv. Pap.* pl. v. fig. 9. ♀.

*Upper Side.* The body and wings are of a dusky brown. The superior wings have a large spot of lightish brown orange on the fan tendons ; in which is situated near the apex a round black spot, having a white speck in the middle. This spot is placed on the fourth fan membrane ; and it is worthy of remark, that all the European butterflies which feed on grass have an eye-like spot in the same place ; and the whole of their natural history is entirely similar.

The *under side* of the wings are of a pale orange brown on the fan membrane ; but the other half, toward the body, is covered with a dark brown cloud. The eye-like spot on this side appears double ; but in the male it is always single.

The caterpillar feeds on grass ; and when full fed, as at (*a*), which happens about the tenth of May, it changes to a green chrysalis, spotted with brown, as at (*b*) ; and the fly appears about the eleventh of June. The upper side of the female is seen at (*c*), and the under side at (*d*). The male is described at (*e*).

Expansion of the wings  $1\frac{1}{2}$ — $2\frac{1}{4}$  inches.

This is one of our commonest butterflies, frequenting both meadows and grassy lanes, and appearing to be but little influenced by the variations of the seasons. "This butterfly, so well known to every one," says Mr. Knapp, "I have never missed in any one year ; and in those damp and cheerless summers, when even the white cabbage butterfly is scarcely be found, this creature may be seen in every transient gleam drying its wings, and tripping from flower to flower with animation and life, nearly the sole possessor of the field and its sweets. Dry and exhausting as the summer may be, yet this dusky butterfly is uninjured by it ; and we see it in profusion hovering about the sapless foliage. In that arid summer of 1826, the abundance of these creatures was so obvious as to be remarked by very indifferent persons."—*Journal of a Naturalist*, p. 288.

MANCIPIUM CARDAMINES. THE WOOD LADY, OR ORANGE TIP,  
BUTTERFLY.

Plate XXXII. fig. *f*—*i*.

SYNONYMS. *Papilio* (Dan. Cand.) *Cardamines*, *Linn. Syst. Nat.* ii. 761. *Lewin's Papil.* pl. 30.  
*Donovan Brit. Ins.* vol. v. pl. 169. *Roesel. Ins. Class 2. t. 8.* *Duncan Brit. Butt.*  
pl. 10. f. 1. male, 2. female.  
The Orange-tip, or Lady of the Woods, *Wilkes' Eng. Moths, &c.* pl. 99.  
*Pontia Cardamines*, *Ochsenheimer, Curtis, Samouelle.*  
*Mancipium Cardamines*, *Hubner.*  
*Anthocaris Cardamines*, *Boisduval Hist. Nat. Ins. Lep.* i. p. 564.

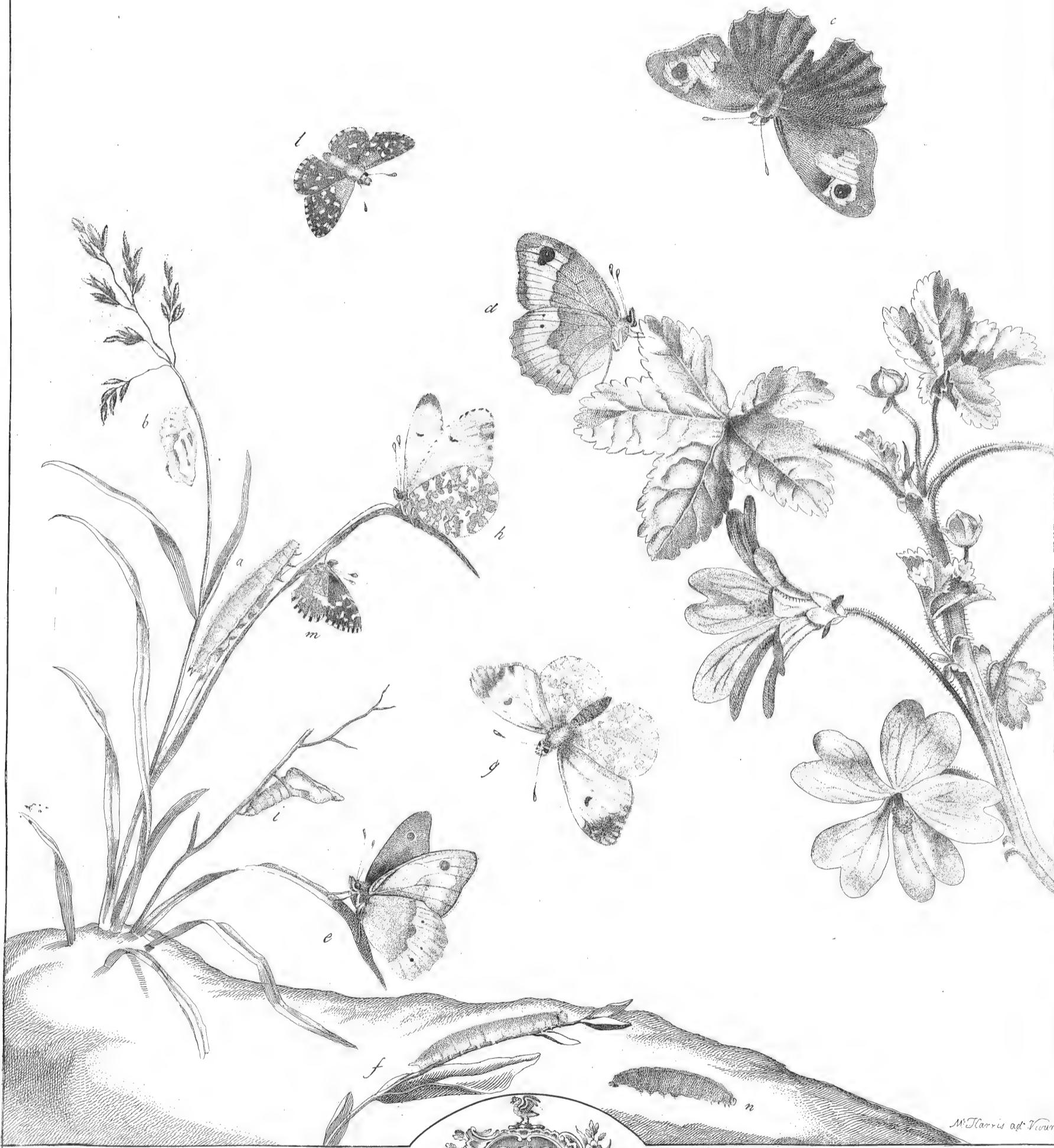
*Upper Side.* The head is green. The thorax and abdomen are of lead colour. The superior wings are white; but the apex, for a quarter of an inch in the wing, is black. In the centre of the wing is a black spot, just on the bar tendon.

The *under side* of the superior wings is white, green at the apices, and with a black spot on the bar tendon. The inferior wings are white, beautifully besprinkled and dappled with green. The male hath the outer half of the superior wings of a beautiful orange colour. The female is shewn at (*g*), and the male at (*h*).

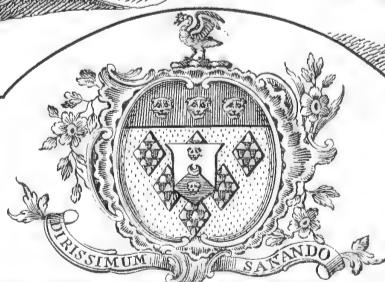
The caterpillar, represented at (*f*), is full fed about August; and changes into chrysalis, as seen at (*i*); lies during the winter in that state, and the fly appears the beginning of May.

Expansion of the wings  $1\frac{1}{3}$ —2 inches.

This pretty butterfly is one of the gayest ornaments of our pastures in spring; the time of its appearance being either the end of April or beginning of May, being very regular in the period of its coming forth, varying but few days in the course of many years. Stephens, however, gives the end of May as the ordinary time of its appearance; and adds a further note, that of six pupæ of this species two came to perfection at the end of May, one in the beginning, one at the end of June, and the other towards the middle of July; thus accounting for the continuance of the insect in its final state. The caterpillar is green, with a white lateral stripe placed above the legs; it feeds, according to Stephens, upon *Cardamine impatiens*, *Turritis glabra*, *Brassica campestris*, &c. preferring the seeds. The chrysalis, which is strongly curved, and has a curious produced spindle-shaped beak or process, is either green or brown, with a fulvous spot on the wing-cases of the male. According to some writers, the males of this species sometimes swarm in a field with scarcely a single female being seen amongst them, (*Ins. Misc. p. 215.*, *Mag. Nat. Hist. No. 41*); but this circumstance appears only to be accidental, and not constant, if not doubtful, (*see Bree in do., No. 26*). Boisduval mentions a variety in which the female has an orange spot on the under side of the fore wings, nearly as bright as in the male.



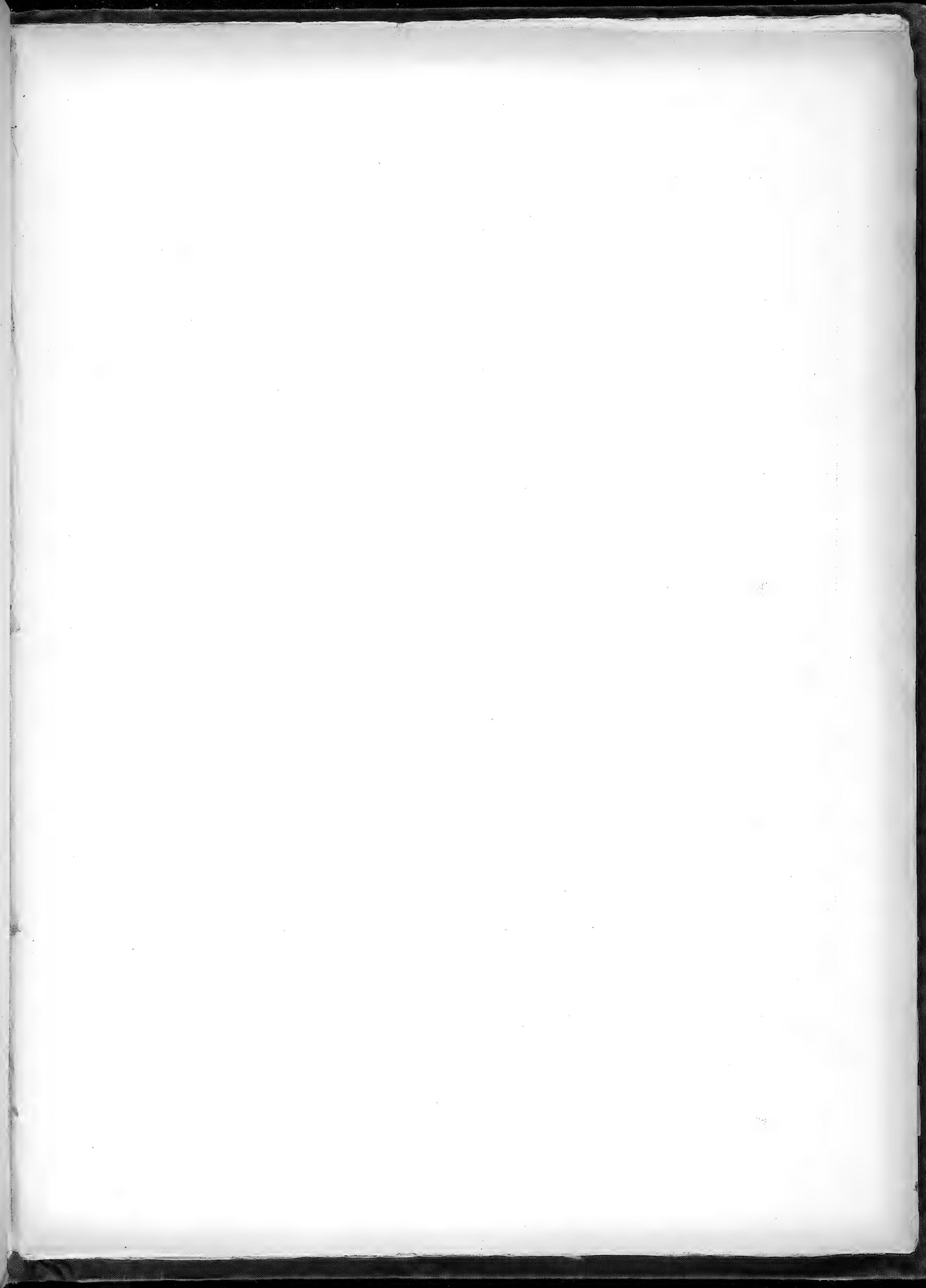
To Richd Guy Esq.  
Dedicated by his



this Plate is Humbly  
Obliged Servt  
MOSES HARRIS.

McHarris ad. Novem







## THYMELE ALVEOLUS. THE GRIZZLE SKIPPER BUTTERFLY.

Plate XXXII. fig. *l*—*n*.SYNONYMS. *Papilio Alveolus*, *Hubner*.*Thymele Alveolus*, *Fabricius*, *Stephens*. *Duncan Brit. Moths*, &c. pl. 1. fig. 1.*Papilio Malvae*, *Lewin's Pap.* pl. 46. f. 8. 9. *Haworth*. *Wilkes' Eng. Moths*, &c. pl. 104.?*Hesperia Malvae*, *Leach*, *Samouelle*.

*Upper Side.* The whole fly is of a dark lead colour, speckled all over with small square specks. The fringes are checkered with black and white.

The *under side* is similar to the upper; but the inferior wings are paler.

Roesel says, the caterpillar is found on the common mallow, enclosed in a web; that it lies in chrysalis eleven days, and that the fly, when it appears from the chrysalis, produces blood from the abdomen. The caterpillar is shewn at (*n*). The upper side of the fly is represented at (*l*), and the under at (*m*).

Expansion of the wings 10—14 lines.

This species is common in the woods, commons, and meadows near London, as well as in various parts of the kingdom.

## SMERINTHUS POPULI. THE POPLAR HAWK-MOTH.

Plate XXXIII. fig. *a*—*g*.SYNONYMS. *Sphinx Populi*, *Linn. Syst. Nat.* ii. 797. *Donovan Brit. Ins.* vol. vii. pl. 241. *Albin's**Ins.* pl. 57. *Wilkes' Eng. Moths*, pl. 25.*Smerinthus Populi*, *Latreille*, *Stephens*, *Curtis*. *Duncan Brit. Moths*, pl. 3. fig. 2.

*Upper Side.* The antennæ are notched on the inner side. The superior wings are of a purplish ash colour, clouded with olive colour: the tendons of the wings are light brown. On the bar tendon is a white spot. The inferior wings are of a strong red near the abdomen. The fan edges are all dentated.

The *under side* is similar to the upper, but rather more on the purple. The upper side is seen at (*g*) and (*d*), where it is sitting in its natural position. The under side is seen at (*f*).

The caterpillar feeds on the poplar and willow. It proceeds from an egg of a green colour, laid by the parent on the stalks of the food, as represented at (*c*). They are full fed in September, as at (*a*) and (*b*), when they go into the ground and change into chrysalis, which is exactly represented at (*e*). The moths appear the beginning of May.

Expansion of the wings 3—4½ inches.

This is one of the commonest species of hawk-moths found in this country; it is extremely sluggish in its motions, and its flight is heavy, having none of that hawk-like motion so conspicuous in the rest of the family to which it belongs, its mouth or spiral tongue being also very short and membranous, unfitting it for probing the long tubular flowers which serve for the subsistence of its more active brethren.

MARGARITIA VERTICALIS. THE SMALL MAGPIE LIKENESS, OR MOTHER OF PEARL MOTH.

Plate XXXIII. fig. *h*—*l*.

SYNONYMS. *Phalæna (Pyralis) Verticalis*, *Linn. Syst. Nat.* ii. 882. *Donovan Brit. Ins.* 16. pl. 556. *Albin's Insects*, pl. 73. fig. *a*—*d*. *Wilkes' Brit. Moths*, pl. 51. *Margaritia Verticalis*, *Stephens*.

*Upper Side.* The antennæ are like hairs. The head, thorax, abdomen, and wings are of a buff colour, having a gloss all over them like mother of pearl; a number of faint spots and regular markings are seen on the wings.

The *under side* is similar to the upper, but fainter. See the figure at (*h*).

The caterpillar feeds spun up in a leaf of the nettle, as at (*l*); wherein it changes to the chrysalis, the end of June. The moth appears in July. The caterpillar is seen at (*h*), and the chrysalis at (*i*).

Expansion of the wings one inch and a quarter.

MÆSIA FAVILLACEARIA. THE GREY SCOLLOPED BAR MOTH.

Plate XXXIII. fig. *m*.

SYNONYMS. *Geometra favillacea*, *Hubner, Haworth*. *Phalæna medio-punctaria*. *Donovan Brit. Ins.* vol. xiii. pl. 461. fig. 1. *Bupalus favillacearius*, *Leach*. *Curtis Brit. Ent.* pl. 33. *Mæsia favillacea*, *Stephens*.

*Upper Side.* The antennæ are like fine threads. The whole moth is of a pale ash colour, having two interrupted bars crossing the superior wings, and one on each inferior wing. It is represented at (*m*). It was sent me by Mr. Bolton, of Halifax in Yorkshire. It has never been described before.

Expansion of the wings one inch and a quarter.

EUBOLIA CHÆNOPODIATA. THE SHADED BROAD BAR, OR SMALL MALLOW MOTH.

Plate XXXIII. fig. *n*.

SYNONYMS. *Phalæna (Geometra) Chænopodiata*, *Linn. Syst. Nat.* ii. p. 868. *Geometra Mensuraria*, *Hubner*. *Larentia Chænopodiata*, *Stephens*. *Eubolia Chænopodiata*, *Duponchel, Curtis*.

*Upper Side.* The antennæ are like threads. The superior wings are of a pale quaker colour, having a broad bar of a darkish colour crossing the middle of each. The inferior wings are of a dusky brown, having a narrow line crossing the middle of each. This was sent me by the same gentleman who sent the above, who says it was taken in May.

Expansion of the wings one inch.





## ANARTA HELIACA. THE SMALL YELLOW UNDERWING MOTH.

Plate XXXIII. fig. o.

SYNONYMS. *Noctua Heliaca*, *Wien. Verz. Hubner*.  
*Anarta Heliaca*, *Ochsenheimer, Stephens*.  
*Noctua Arbuti*, *Fabricius*. *Donovan Nat. Hist. Brit. Ins.* x. pl. 343. fig. 3.  
*Noctua Fasciola*, *Esper*.

*Upper Side.* The antennæ are like hairs. The body and superior wings are of a fine deep brown colour, having some dark clouds. The inferior wings are black, having a large spot of yellow or gold colour in the middle of each, of the size of half the wing. It is described at (o). They may be taken about the end of May, flying among long grass, by hedge sides.

Expansion of the wings three-quarters of an inch.

## ARGYNNIS PAPHIA. THE SILVER-WASHED FRITILLARY BUTTERFLY.

Plate XXXIV. fig. k—n.

SYNONYMS. *Papilio* (Nymph. Phal.) *Paphia*. *Linn. Syst. Nat.* ii. p. 785. *Lewin's Papil.* pl. 9.  
*Donov. Brit. Ins.* 7. pl. 247. ♂. *Haworth*.  
*Argynnis Paphia*, *Ochsenheimer, Leach, Stephens, Curtis, Duncan Brit. Butt.* pl. 14. f. 1.  
*The Great Fritillary Butterfly, Wilkes' Brit. Moths & Butt.* pl. 110.

*Upper Side.* The head, thorax, and abdomen are of a greenish brown. The wings are dentated, and of a yellow brown orange colour, spotted all over with round spots of black. The wings near the body are greenish. The under side of the superior wings are of a dark buff colour, spotted, as on the upper side. The inferior wings greenish or pale olive, having a number of waved lines, which appear like silver. The female is seen flying at (m). The male is deeper in colour; and the first, second, and third fan tendons are black, and very thick with hair. See the figure at (n). They fly the beginning of June.

The caterpillar is seen at (k), and the chrysalis at (l), as copied from Roesel.

Expansion of the wings  $2\frac{2}{3}$ —3 inches.

This is the largest species of British Fritillaries. It occurs plentifully in the south of England, and also, but more rarely, in Scotland. The caterpillar is light brown, yellowish on the back, with two dark lines along the sides, the spines on the body are long and bristly, and two on the segment behind the head are greatly elongated.

M. Wesmael has described and figured a singular *Gynandromorphus* individual of this species, in which the right side has the characters of the ordinary male, except that the outer edge has a row of spots as in the female. The fore wing on the left-hand exhibits "un mélange de la coloration du mâle et de celle de la variété femelle, le valaisien," and the hind left wing is exactly coloured as in the female of that variety. (*Bull. de l'Acad. de Bruxelles*, tom. iv.) Ochsenheimer has also described a nearly similar individual of the same species.

Mr. Conway states, that he generally finds this insect resting on the blossoms

of the common blackberry, and has often admired its fine flight as it has taken its circuitous progress, sweeping the area of several fields, and then returning and settling upon the same blossom again. Its flight appears to be taken almost without effort, and is effected with the greatest leisure and coolness imaginable; but if once disturbed it darts off again with the impetuosity of the swiftest hawk.

#### INO STATICES. THE FORESTER MOTH.

Plate XXXIV. fig. *a*—*f*.

SYNONYMS. *Sphinx Statices*, *Linn. Syst. Nat.* ii. 808. *Donov. Brit. Ins.* pl. 204. fig. 2.  
*Ino Statices*, *Leach*, *Stephens*, *Curtis*. *Duncan Brit. Moths*, pl. 2. fig. 3.

*Upper Side.* The antennæ are thick toward the end. The head and thorax are of a fine blue green. The superior wings are of a glorious green, shining like satin. The inferior wings are of a dusky black, almost transparent. The abdomen is of a shining blue green.

The caterpillar, which is described at (*a*) and (*b*), feeds on sorrel; and is found full fed the beginning of May. It spins up in a double buff-coloured case, shewn at (*c*); and changes to a chrysalis, of a light brown colour, seen at (*d*). The moth appears the end of May. The female is shewn flying at (*e*), and the male at (*f*), shewing the under side.

Expansion of the wings 1—1½ inches.

This pretty little species is very abundant in grassy places, although evidently affecting certain localities. It flies like the Burnet Moths by day, but its flight is slow and destitute of that rapid motion so conspicuous in many other day-flying Moths.

#### HALIA VAUARIA. THE L. OR GOOSEBERRY MOTH.

Plate XXXIV. fig. *g*—*i*.

SYNONYMS. *Phalæna* (Geom.) *Vauaria*, *Linn. Syst. Nat.* ii. p. 863. *Donovan Brit. Ins.* vol. vi. pl. 196. *Albin's Ins.* pl. 47. fig. 78. *a*—*d*. *Wilkes' Eng. Moths*, pl. 86.  
*Halia Vauaria*, *Duponchel*, *Curtis*.  
*Grammatophora Vauaria*, *Stephens' Cat.*  
*Zerynthia Vauaria*, *Curtis*.

*Upper Side.* The antennæ are like threads. The body and wings are of a pale brown. The superior wings have three black marks on the sector edge; the middle one of the three is formed like the letter L.

The caterpillar feeds on the gooseberry and currant trees; is full fed, as at (*g*), about the end of May: changes in the earth to a brown chrysalis, seen at (*h*); and the moth appears the beginning of June. It is represented at (*i*), shewing the upper side of its wings.

Expansion of the wings one inch and a quarter.

## LYCÆNA PHLÆAS. THE [SMALL] COPPER BUTTERFLY.

Plate XXXIV. fig. *p.*

SYNONYMS. *Papilio* (Pleb. Rur.) *Phlæas*, *Linn. Syst. Nat.* ii. 793. *Lewin's Pap.* pl. 41. *Donov. Brit. Ins.* vol. xiii. pl. 466.  
*Lycæna Phlæas*, *Fabricius*, *Leach*, *Stephens*, *Curtis. Duncan Brit. Butt.* pl. 30. fig. 3.  
*Papilio Virgaureæ*, *Harris' Aurel. 1st. edit. note.*

*Upper Side.* The head and body are of a very dark brown. The superior wings are of a shining red, like burnished copper, having eight round spots of black dispersed over each, and a broad dark border along the fan edge. The inferior wings are dark brown; the fan edge having a red border, in which are four spots of black in each wing. The abdominal corners are angulated. See the fig. at (*p*). There are two broods a year; the first in June, the other in August. They are during the winter in the fly state.

Expansion of the wings 1—1½ inches.

This pretty little butterfly is one of our commonest and best known insects, the brilliant copper colour of its wings, rendering it every where conspicuous. It especially prefers dry localities, such as road sides, commons, pastures, and heaths. The caterpillar is green, with a yellow stripe down the back, and feeds on the sorrel. This is a pugnacious little creature, keeping up a continual warfare with the little blue butterflies which frequent the same situations and flowers. No sooner do these two enemies come near together than a battle ensues, and they continue buffeting each other about till one is driven from the contest, when the victor returns in triumph to the station he had left. Should the enemy again advance the combat is renewed, but should a cloud obscure the sun, or a breeze chill the air, their ardour becomes abated, and contention ceases. Its own kindred are also equally the objects of its attack, and seldom are two disturbed on a knot of asters in September, without mutual strife ensuing, and being much less affected by cold and moisture than the blues, they remain with us much longer, and these contentions are protracted till late in the autumn. (*Journal of a Naturalist*, p. 277.)

## THYMELE TAGES. THE DINGY SKIPPER BUTTERFLY.

Plate XXXIV. fig. *o.*

SYNONYMS. *Papilio* (Plub. Urb.) *Tages*, *Linn. Syst. Nat.* ii. 795. *Lewin's Papil.* pl. 45. fig. 3. 4.  
*Hesperia Tages*, *Leach*, *Samouelle*.  
*Thymele Tages*, *Stephens. Duncan Brit. Moths*, pl. 1. fig. 2.

*Upper Side.* The antennæ are crooked at the knobbed part. The palpi are large and conspicuous. The wings are totally of a dark brown, having some small cloud-like spots crossing the superior wings, of a light slate colour. It is shewn in the plate at (*o*); and flies about the beginning of May.

Expansion of the wings 1—1½ inches.

The caterpillar of this species is described as bright green, with a brown head

and yellow stripes, dotted with black on the back and sides ; it feeds on the *Eryngium campestre* and *Lotus corniculatus*. The butterfly is widely distributed all over the kingdom.

GORTYNA FLAVAGO. THE MOTTLED, OR FROSTED ORANGE MOTH.

Plate XXXV. fig. *a—e*.

SYNONYMS. *Noctua Flavago*, *Wien. Verz.*, *Hubner*.

*Gortyna Flavago*, *Ochsenheimer*, *Curtis*, *Stephens*. *Duncan Brit. Moths*, pl. 24. fig. 2.

*Noctua Ochraceago*, *Haworth*.

*Ph. Noctua Lappae*, *Donovan Brit. Ins.* vol. x. pl. 340.

*Noctua Rutilago*, *Fabricius*.

*Upper Side.* The antennæ are like fine threads. The thorax is crested, and of a fine dark brown colour. The superior wings are of an orange colour ; have a cloud, which covers the shoulder part, and a stripe or band of a dark brown colour which crosses the wing over the fan membranes. The inferior wings are almost plain. The male is smaller, and much paler. See the figures at (*d*) and (*e*).

The caterpillar feeds in the stalk of the burdock, upon the pith. When full fed, as at (*a*), it changes into chrysalis, seen at (*b*), within the stalk, stopping up both ends of its cell with the dung, and leaving a hole, as at (*c*), covered over thinly with silk : and the moth appears the latter end of August.

Expansion of the wings one inch and a half.

CEROPACHA DILUTA. THE HALF MOURNER MOTH.

Plate XXXV. fig. *f—g*.

SYNONYMS. *Noctua Diluta*, *Wien. Verz.*, *Fabricius*, *Hubner*, *Haworth*.

*Ceropacha Diluta*, *Stephens*.

*Tethea Diluta*, *Ochsenheimer*, *Curtis*.

*Noctua Octogena*, *Esper*. 4. pl. 128. fig. 6.

*Upper Side.* The antennæ are like hairs. The thorax is smooth. The whole insect is of a light greyish brown, having two dark greyish bars crossing each of the superior wings. The inferior wings are something similar to the superior, but much paler. See the figure at (*g*).

The caterpillar, which is described at (*f*), feeds on the oak ; changes to chrysalis the beginning of June, in a spinning against a leaf, &c. and the moth appears the latter end of August.

Expansion of the wings one inch and a half.

HIPPARCHIA HYPERANTHUS. THE RINGLET BUTTERFLY.

Plate XXXV. fig. *h*.

SYNONYMS. *Papilio* (Dan. Fest.) *Hyperanthus*, *Linn. Syst. Nat.* ii. 768. *Lewin's Papil.* pl. 20.

*Donov. Brit. Ins.* vol. viii. pl. 271.

*Hipparchia Hyperanthus*, *Ochsenheimer*, *Leach*, *Curtis*, *Stephens*. *Duncan Brit. Butt.* pl. 24. fig. 4.

*Papilio Polymeda*, *Scopoli*, *Hubner*.



M<sup>o</sup> Harris ad C. Scul.

To the Hon<sup>ble</sup> Cha<sup>r</sup>. von Linne, Knight of the Polar Star  
Professor of Medicine & Botany at Upsal,  
This plate is most humbly dedicated by

First Physician to the King of Sweden,  
& Member of all the Learned Societies in Europe  
his Obl<sup>d</sup> Serv<sup>r</sup> Moses Harris.



*Upper Side.* This side is wholly of a dark brown colour, having a faint appearance of an eye-like spot near the apex of the superior wings, in the fourth fan membrane.

The *under side* is rather of a lighter brown than the upper, having a number of eye-like spots in both wings; viz. the male has always fewer than the female: the latter having frequently three in the superior wing, and six in the inferior. It is seen in the plate at (h); which represents a male. They may be taken flying about the end of June, in woods.

Expansion of the wings  $1\frac{1}{2}$ — $2\frac{1}{4}$  inches.

This plain-coloured butterfly is a most abundant species, frequenting fields, open skirts of woods, grassy lanes, &c. Its pretty eye-like markings are subject to endless variations. The caterpillar is described as whitish grey or dusky, with a black line behind; it subsists chiefly on the annual meadow-grass, at the roots of which it resides. The chrysalis is bright brown, with obscure streaks and dashes.

#### HARPALYCE FULVATA. THE CLOUDED YELLOW MOTH.

Plate XXXV. fig. l.

SYNONYMS. *Geometra Fulvata*, *Wien. Verz. Forster Cent.* 1. 76.  
*Phalæna Sociata*, *Fabricius*, *Stewart*.  
*Harpalyce Fulvata*, *Stephens*.  
*Electra Fulvata*, *Curtis*.

*Upper Side.* The antennæ are like fine threads. The head, thorax, and superior wings are of a fine deep yellow, having a broad bar crossing the middle of the wings, of a brown colour edged with a whitish line. They fly about the middle of June; and are taken by beating hedges of white-thorn. See the fig. at (l).

Expansion of the wings one inch.

#### CYCNIA MENDICA. THE SEVEN SPOT ERMINE, OR SPOTTED MUSLIN MOTH.

Plate XXXV. fig. m.

SYNONYMS. *Phalæna (Bombyx) Mendica*, *Linn. Syst. Nat.* ii. 822. *Donov. Brit. Ins.* xi. pl. 388.  
*Marsham in Linn. Trans.* vol. 1. pl. 1. fig. 3.  
*Arctia Mendica*, *Leach*.  
*Diaphora Mendica*, *Stephens*.  
*Cycnia Mendica*, *Hubner*, *Stephens*.

*Upper Side.* The antennæ are like threads. The moth is totally white, having seven black spots in each of the superior wings, and three in each inferior. This I received from a gentleman in Yorkshire.

Expansion of the wings  $1\frac{1}{6}$ — $1\frac{1}{2}$  inches.

## BREPHA PARTHENIAS. THE ORANGE UNDERWING MOTH.

Plate XXXV. fig. *i*.

SYNONYMS. *Phalæna (Noctua) Parthenias*, *Linn. Syst. Nat. ii. 835. Donov. Brit. Ins. 7. pl. 246. f. 1.*  
*Brepha Parthenias*, *Ochsenheimer, Hubner, Stephens, Curtis.*  
*Bombyx Vidua, Fabricius, Wiener Verz.*

*Upper Side.* The antennæ are like fine threads. The head, thorax, and superior wings are of a light brown, clouded with many broad shades. The inferior wings are of a deep orange colour, having a large cloud of black at the abdominal edge. They are taken in woods, the beginning of April.

Expansion of the wings one inch and a quarter.

## PAPILIO MACHAON. THE SWALLOW-TAIL BUTTERFLY.

Plate XXXVI.

SYNONYMS. *Papilio (Eq. Ach.) Machaon. Linn. Syst. Nat. ii. 750. Lewin's Papil. pl. 36. Donov. Brit. Ins. pl. 211. Samouelle Compend. pl. 5. fig. 1. Duncan Brit. Butt. pl. 4. f. 1. Wilkes' Eng. Moths, &c. pl. 93. Stephens, Curtis, Leach, Boisduval, Horsfield, Ochsenheimer, Fabricius.*  
*Amaryssus Machaon, Dalm. Sw. Taans. 1816.*  
*Royal William Butterfly, Pet. Pap. pl. 2. fig. 5.*

*Upper Side.* The eyes and nose are black, (the palpi are very small). The eyes are encircled with yellow; which continues along the sides, some way of the thorax, which is black. The superior wings and inferior wings are yellow: the former having a cloud, which extends from the thorax some way into the wing. Another large black spot, nearly the size of a horse-bean, covers the middle part of the table; and another about the same size just without the bar tendon. These spots all join to the sector edge. The fan edges of both superior and inferior wings have a broad border of black, in which are many yellow spots; one on each membrane. The abdomen is yellow, having a broad list of black down the upper part. At each of the abdominal corners is an eye-like spot of red, encircled with black. Each inferior wing hath a kind of tail, of about half an inch in length, strengthened by the third fan tendon. All the tendons are black and conspicuous. The upper side is shewn at (*f*), and the under at (*g*).

The caterpillars feed on meadow saxifrage; when young they are very dark-coloured, as at (*a*); at which time they have also two red horns, which they can extend or retract at pleasure. In the last skin, which happens about the end of September, these are lost; and the caterpillars appear as at (*b*): when full fed they spin themselves up against a leaf, stick, &c. fastening the tail part, and bringing another thread round the middle. See the figure at (*c*), which is represented as making its spinning or fastening: here it changes into chrysalis, seen at (*d*) and (*e*); and the flies appear the May following. From these proceed another brood, which comes to the fly state in August.

Expansion of the wings three inches and a half.

This beautiful butterfly, the largest of our native species is very local in this country, occurring in considerable abundance in the fenny parts of Cambridge and Huntingdonshire. It has also been found, but more rarely, in other southern counties of England. The caterpillar ordinarily feeds upon such umbelliferous



To the Rev. Mr. Will<sup>m</sup> Ray  
This Plate is humbly Dedicated by his most humble Obed<sup>t</sup> Serv<sup>t</sup> Moses Harris





plants, as fennel and carrot, preferring the flowers. The retractile Y shaped appendage upon the neck of the larva emits a strong scent when the insect is irritated, and it is supposed that this has the effect of guarding it from the attacks of Ichneumons. The peculiar manner in which the chrysalis is girt round the middle of the body, as well as attached by its posterior extremity, in this and some other species, has been employed as one of the chief characters to separate the modern restricted families Papilionidæ and Lycænidæ from the Nymphalidæ, in which the chrysalis is merely suspended by the tail: the proceedings by which their different modes of attachment are effected have been carefully described and figured by Réaumur, whose account and figures have been copied into the popular works of Entomology lately published in this country, such as the "Insect Transformations", "the Natural History of Insects" in the Family Library.

It has been generally supposed that there are two broods of this insect in the course of a year, as above stated, one in May and another in August; but Mr. Stephens, on the authority of Mr. Blunt, considers this supposition inaccurate, the latter gentleman having taken the larva in all its stages at one time, and the perfect insect having made its appearance with regularity from the end of May to the middle of August: but the Rev. Leonard Jenyns, whose residence near the fens between Ely and Cambridge enables him to observe the appearance of these butterflies with greater certainty, states that there are two broods, the first of which appears in the third and sometimes in the second week in May; the second about the middle of July. He also states that he has always found the larvæ on the marsh-milk-parsley (*Selinum palustre*), to which they are most attached, though in confinement they feed readily on other species of umbellatae. The fact of the larvæ being found in various stages of growth at the same time, as noticed by Mr. Stephens in his Illustrations, and again repeated by him in the Entomological Magazine, vol. 1. p. 527,\* is not of itself sufficient to prove that there are not regularly two broods in the year, but merely that there is an irregularity in the time of appearing of the individuals of each brood. Réaumur states that the first brood in France goes into chrysalis in July, and the butterfly appears in thirteen days; the second in autumn, the butterfly not appearing till the succeeding June; but by placing the latter brood in an artificial temperature of due warmth, and properly kept up, they were produced in the perfect state in as short a period as the first brood.

Mr. Babington has observed that there is a marked difference in the colours of the chrysalides of this species, corresponding with the difference of sex in the individuals to be produced therefrom; the supposed female chrysalides being grass-green, the males varying from nearly black to light brownish-rufous. (*Mag. Nat. Hist. No. 6. old series.*) Boisduval states that these chrysalides are sometimes of a greyish colour, and sometimes green with a lateral yellow band. Boisduval also states, that the species is found throughout Europe, Siberia, Syria, Egypt, and the coast of Barbary. He also possesses specimens from Nepaul and Cachemire, which do not differ in the slightest degree from those of Europe. I have also received

\* "The larva in various stages of growth on the 29th June in Sedge Fen, Camb., by W. Christy, Esq.; and 4th and 5th July at Whittlesea Mere."

specimens from the Himalayan mountains, which perfectly agree with our English individuals.

The developement of the wings of the perfect insect has been observed by Messrs. Kirby and Spence, one of whom thus describes it: "I had the pleasure of seeing it leave its puparium [chrysalis] the 16th of May: with great care I placed it upon my arm, when it kept pacing about for the space of more than an hour; when all its parts appearing consolidated and developed, and the animal perfect in beauty, I secured it. To observe how gradual, and yet how rapid, was the development of the parts and organs, and particularly of the wings, and the perfect coming forth of the colour and spots as the sun gave vigour to it, was a most interesting spectacle. At first it was unable to elevate or even move its wings; but in proportion as the aerial or other fluid was forced by the motion of its trunk into their nervures, their numerous corrugations and folds gradually yielded to the action, till they had gained their greatest extent, and the film between all the nervures became tense. The ocelli and spots and bars which appeared at first as but germs or rudiments of what they were to be, grew with the growing wing, and shone forth upon its complete expansion in full magnitude and beauty."\*

ACHERONTIA ATROPOS. THE BEE TIGER, DEATH'S HEAD, OR JASMINE HAWK-MOTH.

Plate XXXVII.

SYNONYMS. *Sphinx Atropos*, *Linn. Syst. Nat.* ii. p. 799. *Donov. Brit. Ins.* 9. pl. 289. *Wood Linn.*

*Genera*, 2. pl. 44. *Albin's Ins.* pl. 6. *Wilkes' Eng. Moths, &c.* pl. 19.

*Acherontia Atropos*, *Ochsenheimer, Stephens. Curtis Brit. Ent.* pl. 147. *Duncan Brit. Moths*, pl. 5.

*Upper Side.* The antennæ are very thick and short, of a dark brown colour; the pointed ends are tipped with yellow. The eyes are large and brown. The nose brown. The thorax is of a dark brown, black and grey, greatly blended and mixed together. On the upper part of the latter is the exact figure of a human skull, with the collar bones. The superior wings are of a dark brown, having some glares and undulated lines of a warm yellow, and a small yellow spot on the bar tendon. The inferior wings are of a pale orange or ochre colour, have a broad scalloped border of black, and a soft line of a dark colour crossing the middle of the wing. The abdomen is also light orange, encircled with five rings of black, and a broad blue band down the upper part.

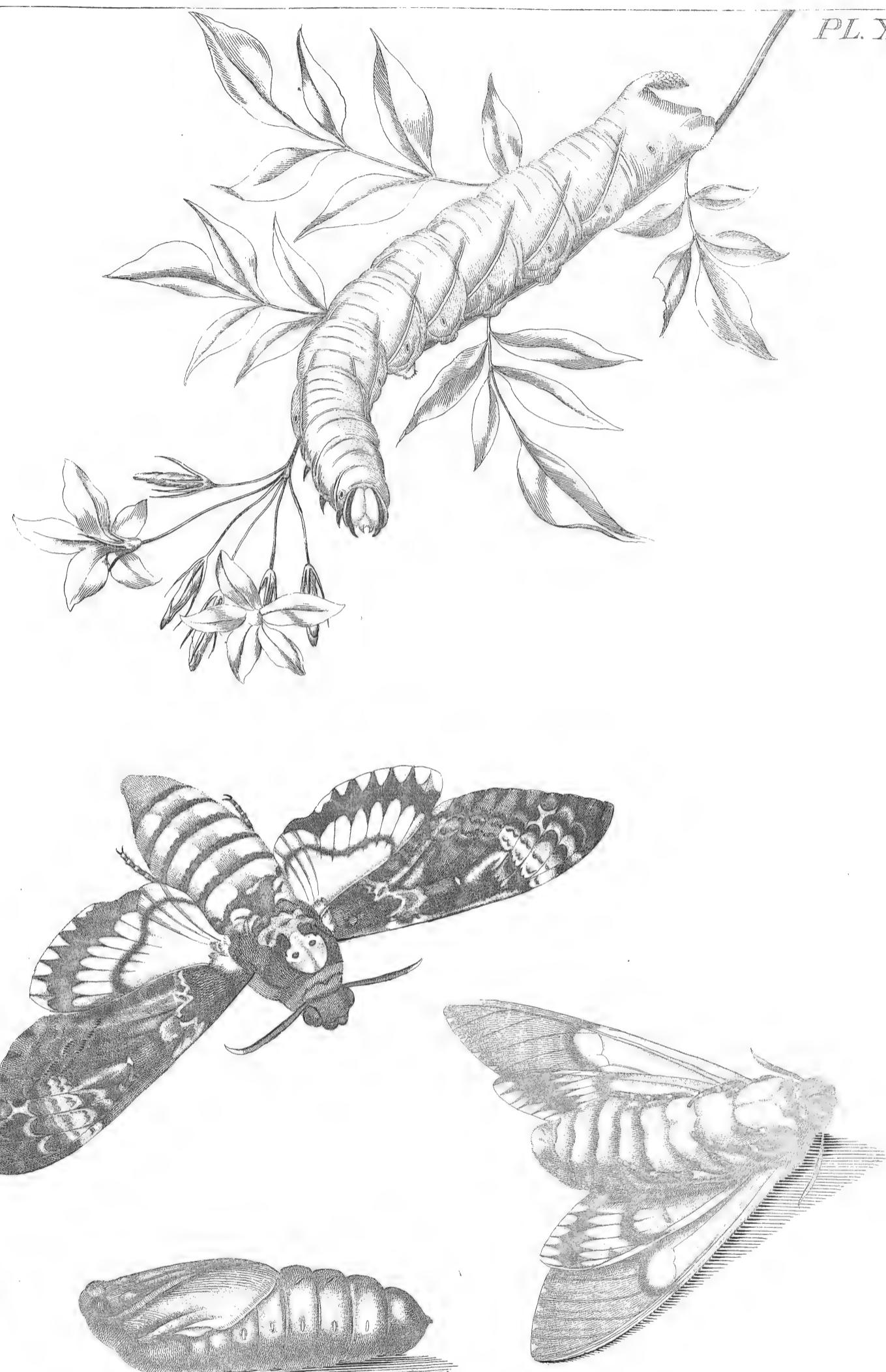
The *under side* of the superior wings is of a light orange toward the thorax, but the other half is of a dusky brown. The inferior wings are similar to the upper side. The body is yellow, legs dark brown, but the joints yellow. The upper side of this moth is shewn in the plate; where the insect is seen flying. It shews the under side as it lies on its back on the stone.

The caterpillars feed on potatoe greens, elder, and jasmine. They change into chrysalis the beginning of September, and the moths appear the end of June following.

Expansion of the wings  $4\frac{1}{3}$ — $5\frac{1}{2}$  inches.

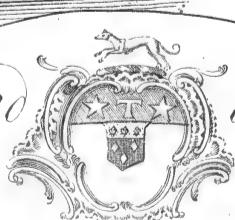
This noble insect, the largest of all the British Lepidoptera, has, since the potatoe has been so abundantly cultivated, become tolerably common, (see *Mag.*

\* *Introduction to Entomology*, vol. iii. 293.



W. Harris ad Vivum Sculp'

To my Ingenious Friend and Benefactor M<sup>r</sup> Dru Drury  
This Plate is most Humbly Dedicated by his Obliged Servant Mo<sup>es</sup> Harris





*Nat. Hist. No. 10*); the caterpillar more especially feeding upon that plant. It requires however to be carefully sought after, as it generally feeds by night, and the moth itself is but rarely seen at large. Sometimes, however, the caterpillars are so numerous as to attract public attention; when the public journals teem with the most ridiculous accounts of the “strange monsters, now for the first time discovered in the country.” Other circumstances likewise tend to cause the Death’s-head-moth to be regarded as an object of alarm by the vulgar: the skull-like patch on the back of the thorax, the large size of the insect, and the singular squeaking noise which it emits when alarmed, and which has been compared to the creaking of a cork; hence Latreille informs us, that “il parut une année en Bretagne, en assez grand nombre et comme à cette époque il y régnait une maladie épidémique qui faisoit périr beaucoup de malades, ou lui attribue cette mortalité.” (*Hist. Gen. des Ins.* vol. 14, p. 128.)

“Superstition has been particularly active,” observes the author of a *Journal of a Naturalist*, “in suggesting causes of alarm from the insect world; and where man should have seen only beauty and wisdom, he has often found terror and dismay: but the dread excited in England by the appearance, noises, or increase of insects, are petty apprehensions when compared with the horror that the presence of this *Acherontia* occasions to some of the more fanciful and superstitious natives of northern Europe, maintainers of the wildest conceptions. A letter is now before me from a correspondent in German Poland, where this insect is a common creature, and so abounded in 1834 that my informer collected fifty of them in the potatoe-fields of his village, where they called them the Death’s-head-phantom, the Wandering Death-bird, &c. The markings on its back represent to their fertile imaginations the head of a perfect skeleton, with the limb-bones crossed beneath; its cry becomes the voice of anguish, the moaning of a child, the signal of grief. It is regarded not as the creation of a benevolent being, but the device of evil spirits—spirits enemies to man—conceived and fabricated in the dark, and the very shining of its eyes is thought to represent the fiery element whence it is supposed to have proceeded. Flying into their apartments in the evening it at times extinguishes the light; foretelling war, pestilence, hunger, death to man and beast. We pity rather than ridicule their fears, their consequences being painful anxiety of mind and suffering of body.”

This noise has been the subject of much investigation, which must still be considered as unsettled. By Réaumur and Rösel it was supposed to be caused by the friction of the labial palpi against each other; and by Passerini that it was produced within the head, in which is a cavity connected with the spiral tongue. M. de Johet attributes it to the action of the air being suddenly impelled against the scales at the base of the wings by the action of the latter, (as cited by Engramelle). Such is also the opinion of M. Vallot; whilst M. Lorey attributes it to the escape of a current of air through certain cavities at the base of the abdomen, which are furnished with a pencil of hairs. M. Goureau has also described this apparatus as the cause of the sound. It is to be observed, however, that this opinion appears to be negatived by the fact that many mute Lepidoptera possess these cavities and pencils of hairs.

This gigantic insect also has the habit of frequenting the hives for the purpose of robbing the bees of their honey. The proprietors of hives in Thuringia, as we learn from Latreille, observed, in 1779, a remarkable movement amongst their bees, which led them to suppose that one of their numerous enemies had gained access to the hive ; but their astonishment was very greatly increased in discovering that this sphinx was the cause of the confusion amongst the bees, which had so entirely enveloped the sphinx that it was not at first perceivable. It is probably attracted to the hive by the scent of the honey ; but the latter circumstance mentioned by Latreille, together with the result of one of M. Huber's experiments, (in which he introduced one of the moths into a colony of humble bees, which immediately attacked it and so severely stung it that it died shortly afterwards,) is sufficient to shew the impropriety of M. Huber's conjecture, that the hostility of the bees is disarmed by the noise made by the moth, which he considered might have an influence in some respects analogous to that made by the queen bee. A remarkable fact M. Huber assures us, as having himself been an eye witness of, that without any foreign aid the bees, as if expecting this gigantic enemy, had barricaded themselves by means of a thick wall of propolis and wax, completely obstructing the entrance of the hive, but penetrated by passages for one or two workers at a time, thus securing themselves by an admirable sagacity against the supposed inefficiency of their weapons and their courage. "The art of warfare among bees," says Huber, "is therefore not restricted to attacking their enemies, they know also how to construct ramparts, as shelter from their enterprises : from the part of simple soldiers they pass to engineers."

#### CERURA VINULA. THE PUSS MOTH.

Plate XXXVIII. fig. *a—e*.

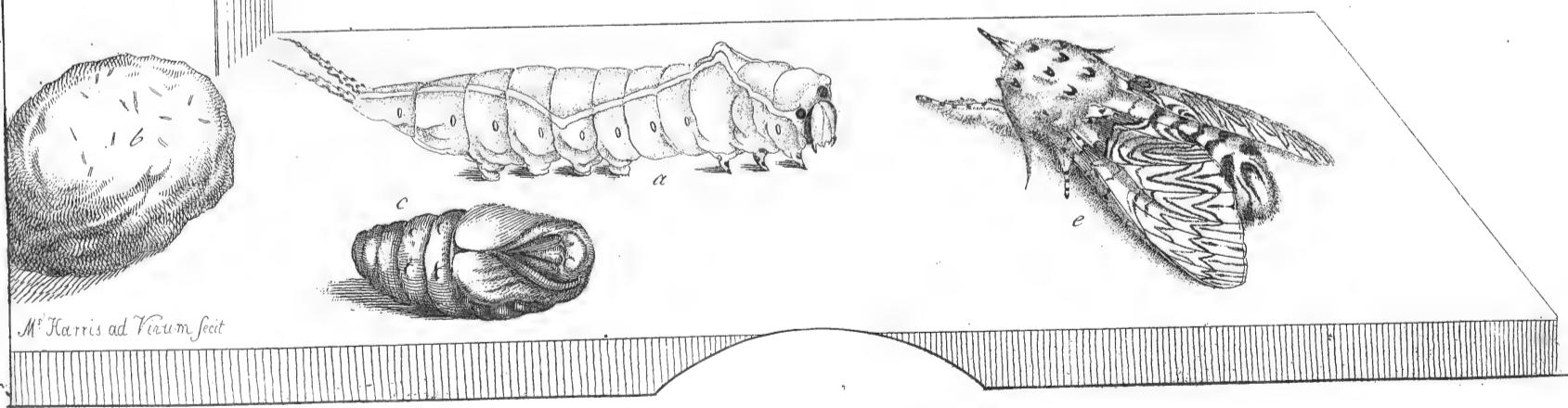
SYNONYMS. *Phalæna* (Bomb.) *Vinula*, *Linn. Syst. Nat.* ii. 815. *Donovan Brit. Ins.* vol. iii. pl. 85.  
*Albin's Ins.* pl. xi. *Wilkes' Eng. Moths, &c.* pl. 29. fig. 1.  
*Cerura Vinula*, *Schrink*, *Leach*, *Stephens*, *Curtis*. *Duncan Brit. Moths*, pl. 16. fig. 1. 2.

*Upper Side.* The antennæ are pectinated. The thorax is white, spotted with black, like ermine. The superior wings are also white, watered something like silks which have been to the press, or like the skins of some cats. The inferior wings are of a lead colour. The figure of this moth is shewn at (*d*) as flying, and at (*e*) sitting in its natural position.

The caterpillars, seen at (*a*) (*a*), feed on lupine and willow ; are full fed about the end of August, when they spin themselves up in very hard cases, shewn at (*b*), where they change into chrysalides ; one of which is shewn at (*e*) : and the moth appears at the end of May. This caterpillar has two red arrows, which it puts forth out of the horns at the tail, when in the last skin but one ; from this it ejects a liquor, when irritated ; but when in the last skin, these parts dry up as it were and grow useless.

Expansion of the wings  $2\frac{1}{2}$ — $3\frac{1}{3}$  inches.

The Puss Moth is a common insect throughout the country. Messrs. Kirby and Spence state that the caterpillar seldom protrudes the fleshy rose-coloured tentaculæ from the two outer tails, unless it be in some way disturbed, and frequently it



M<sup>r</sup> Harris ad Virum fecit







approximates the outer cases so closely that they resemble a single horn. It appears to use these inner horns when protruded, as a kind of whip to drive away the flies, especially the Ichneumons, that alight upon its body. When touched in any place it will unsheathe one of them, and sometimes both, and with them strike the place where it is incommoded. The cocoon is so hard that it is with difficulty cut with a penknife. The moth however is provided with a powerful secretion, the solvent power of which soon loosens the cohesion of the particles, and renders egress easy.

An anonymous writer in the Magazine of Natural History (No. 19) has described a remarkable occurrence in the larva of this insect, having observed it to emit a slight electrical discharge for several times.

#### MELITÆA ATHALIA. THE PEARL BORDERED LIKENESS FRITILLARY BUTTERFLY.

Plate XXXVIII. fig. *f*—*g*.

SYNONYMS. *Papilio Athalia*, *Esper Papil.* pl. 47. fig. 1.  
*Melitæa Athalia*, *Ochsenheimer*, *Stephens*. *Duncan Brit. Butt.* pl. 12. fig. 2.  
*Papilio Dictynna*, *Lewin's Papil.* pl. 14. fig. 5. 6. *Haworth Lep. Brit.* p. 34.  
*Papilio Maturna*, *Fabricius*. *Wilkes Eng. Moths*, pl. 112. *Harris's Aurelian*, former edit.

*Upper Side.* The knobs of the antennæ are large. The wings are of a fine orange brown colour, striped and spotted with black. The fringes of the wings are yellow. See the figure at (*f*).

The *under side* of the superior wings is of a pale orange, having a border of seven lunular spots. The inferior wings are bordered with the same. A broad bar crosses the wing, composed of long oval spots of yellow, and three or four more spots of the same colour near the body; the wing is elsewhere dark red. See the figure at (*g*). They fly in woods about the middle of June, and on heaths.

The caterpillar is black, and full of spriggy bristles. The chrysalis is black, short, and thick; and is suspended by the tail.

Expansion of the wings one inch and three-quarters.

The caterpillar is described by Stephens as black and shining, with two white dotted lines on each segment, and white tubercles on the sides; it feeds on the narrow and broad-leaved plantain, and also, according to Wilkes, on the common heath. The butterfly appears at the end of May, and is abundant in some of the southern counties of England, particularly Devonshire.

#### PYGÆRA BUCEPHALA. THE BUFF TIPP MOTH.

Plate XXXIX. fig. *a*—*c*.

SYNONYMS. *Phalæna* (Bomb.) *Bucephala*, *Linn. Syst. Nat.* ii. p. 816. *Donovan Brit. Ins.* 1. pl. 3.  
*Albin's Ins.* pl. 23. fig. 33. *a*—*d*. *Wilkes' Eng. Moths*, &c. pl. 43.  
*Pygæra Bucephala*, *Ochsenheimer*, *Stephens*. *Curtis' Brit. Entomol.* pl. 530. *Duncan Brit. Moths*, pl. 15. fig. 3.

*Upper Side.* The thorax is of a pale orange in front, but of a buff colour behind; these

parts are separated by a double red line. The superior wings are of a brown colour towards the sector edges, but of an ash colour towards the slip edge; prettily dappled and waved, like the bark of some hazel sticks. At the apex of the wing is a large buff-coloured spot, about the size of the nail of the fourth finger. The abdomen and inferior wings are of a pale buff colour. The moth is shewn in the plate at (c).

The caterpillar, which is seen at (a), feeds on oak and willow; is full fed about the end of September, when it goes into the earth and changes into chrysalis, seen at (b). The moth appears the latter end of May.

Expansion of the wings  $2\frac{1}{6}$ — $2\frac{3}{4}$  inches.

#### TRIPHÆNA PRONUBA. THE LARGE YELLOW UNDERWING MOTH.

Plate XXX. fig. *d*—*f*.

SYNONYMS. *Phalæna* (Noct.) *Pronuba*, *Linn. Syst. Nat.* ii. 842. *Donovan Brit. Ins.* 10. pl. 311.

*Albin's Ins.* pl. 72. fig. *a*—*d*. *Wilkes' Brit. Moths*, pl. 1.

*Triphæna Pronuba*, *Ochsenheimer*, *Curtis*, *Stephens*.

*Upper Side.* The antennæ are like fine threads. The thorax and superior wings are of a fine brown, dappled with light spots, and narrow lines of pleasant brown. A very dark spot appears on the bar tendon, shaped like a human ear. The inferior wings are of a deep yellow, having a black border round the fan edges, one-eighth of an inch wide. See the figure at (f).

The caterpillar feeds under ground, on the roots of grass; changes to the chrysalis about the middle of May, which is shewn at (e); and the moth appears in June. The caterpillar is represented at (d).

Expansion of the wings 2— $2\frac{1}{4}$  inches.

This insect is very abundant, and hides itself during the day in the thickest foliage, and screens itself from the light in the moist grass crops of the mead, where it is perpetually disturbed and roused from its rest by the scythe of the mower. The yellow wagtail is a great destroyer of these insects. It is very soon apprised of their movements, and will often attend the steps of the mower, fearless of harm, to watch for its prey. As soon as the moth rises it is chased, and its exertions and shiftings to escape, and the activity and perseverance of the bird to capture it, are very amusing. (*Journal of a Naturalist.*)

#### POLYOMMATUS ALEXIS. THE COMMON BLUE BUTTERFLY.

Plate XXXI. fig. *g*—*i*.

SYNONYMS. *Papilio Alexis*, *Wien. Verz. Hubn. Pap.* pl. 60. fig. 292.

*Polyommatus Alexis*, *Stephens. Duncan Brit. Butt. vignette title-page.*

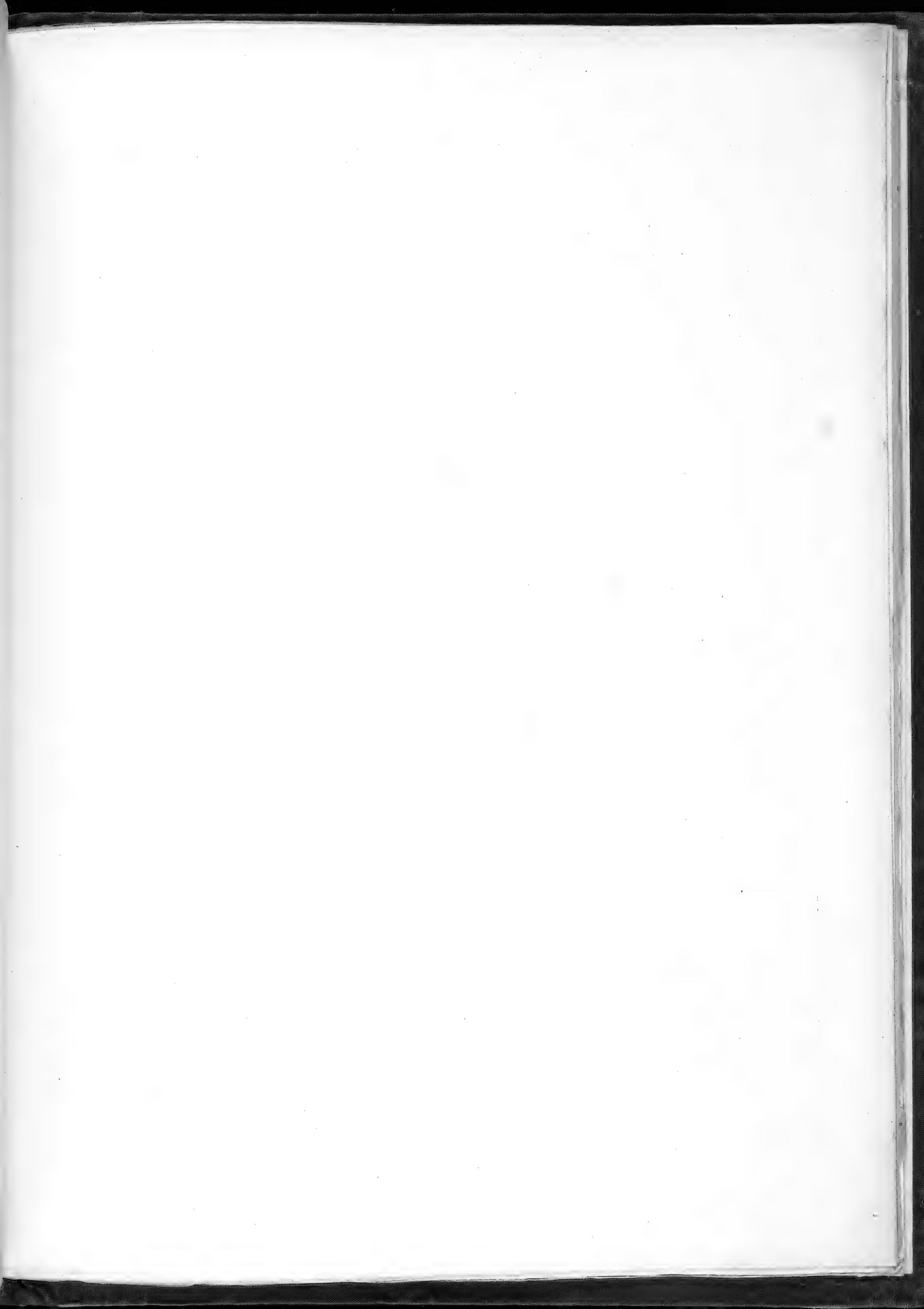
*Papilio Icarus*, *Lewin's Papil.* pl. 38. *Haworth.*

*Papilio Argus*, *Berkenhout. Donovan Brit. Ins.* 4. pl. 143. ♂. *Wilkes' Ins.* pl. 119.

*Harris' Aurel. 1s t edit.?*

*Lycæna Dorylas*, *Leach, Samouelle.*

*Upper Side.* The head, thorax, and abdomen are of a dark blue, nearly black. All the wings are of a very fine blue. The female, seen at (i), is of a dark brown on the upper side,





... Harris ad. Viz. Aug. 14. 1.

To Peter Collinson Esq<sup>r</sup> F.R.S. This Plate is Humbly  
Dedicated by his most Obliged & Obedient Servant MOSES HARRIS.

having but little appearance of blue. The inferior wings have a handsome border, composed of seven eye-like spots, of a red colour, having a black spot in the centre of each.

The *under side* of the wings are handsomely bordered with the same eye-like spots ; the other parts of the wings are of an ash colour, besprinkled all over with small eye-like spots or circles. They are seen in plenty about the beginning of June.

Expansion of the wings 1— $1\frac{5}{12}$  inches.

This elegant little butterfly is one of the commonest English insects, frequenting fields and heaths, marshes and grassy lanes, throughout the country. Its caterpillar, which greatly resembles a wood-louse, is slightly hairy, of a bright green colour, with a dark dorsal line and triangular yellow adjacent spots. It feeds on grasses, *Astragalus glycyphylloides*, and *Fragaria vesca*. The chrysalis, which is short and thick, and girt round the middle of the body, is dark brown. The perfect insect is extremely active, and very pugnacious ; when fully animated it will not suffer any of its tribe to cross its path, or approach the flower on which it sits, with impunity, and will even drive away the large red Admiral (*Vanessa Atalanta*). Between it and the little copper butterfly (*Lycæna Phlæas*) a constant warfare is maintained, and nothing can be more pleasing than the contrast of colours exhibited by the two combatants. Its pugnacious disposition soon however deprives it of much of its beauty, and its wings soon become torn and jagged, and its fine plumage rubbed off. (*Journal of a Naturalist*, p. 277.)

#### HERACLIA DOMINULA. THE SCARLET TIGER MOTH.

Plate XL. fig. *a—e*.

SYNONYMS. *Phalæna* (Noct.) *Dominula*, *Linn. Syst. Nat.* ii. 834. *Donovan Brit. Ins.* 4. pl. 141.

*Albin's Ins.* pl. 22. fig. 31. *a—d*. *Wilkes' Eng. Moths*, pl. 38.

*Hypercampa Dominula*, *Curtis, Stephens*. *Duncan Brit. Moths*, pl. 19. fig. 3. & 4.

(variety.)

*Heraclia Dominula*, *Hubner*. *Stephens Ill. H.* vol. 4. App. p. 386.

*Upper Side.* The antennæ are like threads. The head and thorax are of a deep green, having two long yellow spots on the upper side of the latter. The abdomen is scarlet, having a neat black or dark green stripe along the upper part. The superior wings are of a dark green, having eight or nine spots of a cream colour ; two or three of which nearest the thorax are tinged with orange. The inferior wings are scarlet, having about five irregular spots of black ; the largest of which is near the outer corner. The moth is figured at (*e*), which is a female. The male hath a ring or circle round the abdomen, near the anus.

The caterpillar feeds on nettles and houndstongue, and is found full fed the latter end of April, when it appears as at (*a*). It changes the middle of May, in a spinning, on the ground ; and the moth appears in June. The figure of the chrysalis is seen at (*b*), of a very dark red. The eggs are of a deep gold colour, and adhere to the places where laid.

Expansion of the wings two inches.

The late Captain Blomer mentions having once observed a number of the males of this insect flying about at 12 o'clock on a bright sunny day, and that he captured

six males, which were surrounding a female at one time. (*Mag. Nat. Hist.* No. 21.) This species is far from uncommon.

MELITÆA EUPHROSYNE. THE PEARL BORDERED FRITILLARY BUTTERFLY.

Plate XL. fig. *e—f*.

SYNONYMS. *Papilio* (*Nymph. Phal.*) *Euphrosyne*, *Linn. Syst. Nat.* ii. 786. *Lewin's Papil.* pl. 13. *Donovan Brit. Ins.* vol. ii. pl. 312. *Melitæa Euphrosyne*, *Leach, Stephens.* *Duncan Brit. Butt.* pl. 15. fig. 2.

*Upper Side.* The head and body are of a dark brown. All the wings are of a yellow brown orange, besprinkled over with black spots.

The *under side* of the superior wings is paler than the upper side. The inferior wings are of a dark red brown, having some yellow spots: there are besides, situate in the centre of the wing, two pearl-like or silver spots; and seven of the same kind placed in a row, or like a border along the fan edge. They are taken in woods, and appear about the middle of May.

Expansion of the wings  $1\frac{3}{4}$ —2 inches.

This species is stated to be double brooded; the first brood appearing in May, and the second about the beginning of autumn. (*See Bree in Mag. Nat. History, No. 21.*) The caterpillar is black with two spotted orange stripes on the back; it feeds on various species of violets. The butterfly is one of the commonest of the fritillaries, occurring plentifully in different parts of England.

A singular circumstance has been observed by M. Vandouer of Nantes, relative to this species (recorded in the Annals of the Linnæan Society of Paris): having procured a number of eggs, deposited by a female, he found that the young larvæ, (which he fed with *Viola odorata*) at the end of June fell into a state of lethargy, in which the majority remained until the following spring, some however revived at the commencement of August, and commenced feeding with avidity, they then changed their skins for the fourth and fifth times, and became perfect insects at the end of the same month. This observation explains the reason why the butterflies are so common in the spring, whilst so few are met with in August.

PHLOGOPHORA METICULOSA. THE ANGLE SHADES MOTH.

Plate XLI. fig. *c—e*.

SYNONYMS. *Phalæna* (*Noctua*) *Meticulosa*, *Linn. Syst. Nat.* ii. 845. *Donovan Brit. Ins.* 4. pl. 139. *Albin's Ins.* pl. 30. fig. 46. 47. *a—e*. *Wilkes' Eng. Moths & Butt.* pl. 3. *Phlogophora Meticulosa*, *Ochsenheimer, Treitschke, Stephens, Curtis.* *Duncan Brit. Moths*, pl. 24. fig. 3.

*Upper Side.* The antennæ are like fine threads. The thorax is of a pale olive colour, and crested. The abdomen is rather lighter, and crested also. The superior wings are of a pale brown, indented at the edges. In the middle of the wing is a triangular mark of an olive colour; within which are two more: so that it appears triangle within triangle. The first spot





dark, the next light, and the inner one also dark. The inferior wings are dentated, having some waved marks. See the moth as it is figured at (e).

The caterpillars feed on nettles, chickweed, &c. When full fed, as at (c), they change to the chrysalis state, one of which is figured at (d); and the moths appear the end of May. There are two broods a year; one appears in May, the other in September.

Expansion of the wings one inch and three-quarters.

#### DREPANA HAMULA. THE BROWN HOOK TIPPED MOTH.

Plate XLI. fig. a—b.

SYNONYMS. *Bombyx Hamula*, *Wien. Verz.*, *Hubner*, *Haworth*. *Albin's Ins.* pl. 65. fig. a—d.  
*Phalæna Falcata*, *Fabricius*.  
*Phalæna Lacertinaria?* *Wilkes' Eng. Moths*, &c. pl. 30. *Harris*, 1st. edit.  
*Drepana Hamula*, *Stephens*.

*Upper Side.* The head, thorax, and superior wings are of a brownish orange, having two narrow white lines crossing the middle of the latter. The apices of the wings are hooked. The inferior wings and abdomen are much paler in colour than the superior wings, as may be seen at (b).

The caterpillar, seen at (a), feeds on oak; changes to chrysalis the end of September, and the moth appears the middle of May.

Expansion of the wings one inch and a quarter.

#### EUCLIDIA MI. THE MASK, OR MOTHER SHIPTON MOTH.

Plate XLI. fig. s.

SYNONYMS. *Phalæna (Noctua) Mi*, *Linn. Syst. Nat.* ii. p. 838.  
*Euclidia Mi*, *Ochsenheimer*, *Curtis*, *Stephens*.

*Upper Side.* The antennæ are like fine threads. The thorax brown. The abdomen is also brown. The fringes of each annulus are yellow. The superior wings are of a very dark brown, having narrow lines of a buff colour. In the centre, upon the bar tendon, is a round whitish spot, having a black dot in the middle. The inferior wings are black, spotted all over with small whitish spots. See the figure at (s). They are taken among the grass the end of May.

Expansion of the wings one inch and a quarter.

#### HIPPARCHIA ÆGERIA. THE SPECKLED WOOD [OR WOOD ARGUS] BUTTERFLY.

Plate XLI. fig. f—k.

SYNONYMS. *Papilio (Nymph. Gemm.) Ægeria*, *Linn. Syst. Nat.* ii. p. 771. *Lewin's Papil.* pl. 19.  
*Donov. Brit. Ins.* vol. xiv. pl. 498. *Wilkes' Eng. Moths & Butt.* pl. 103.  
*Hipparchia Ægeria*, *Fabricius*, *Leach*, *Stephens*, *Curtis*. *Duncan Brit. Butt.* pl. 23. f. 4.  
*Papilio Oculatus*, *The Enfield Eye*, *Petiv. Pap.* pl. v. fig. 5. ♀.

*Upper Side.* The whole insect is of a dark brown. The superior wings are speckled with very pale brown spots: in one of these spots, near the apex, is a round black spot, with a white speck in the middle. This spot is on the fourth fan membrane. The inferior wings have four

large light brown spots, only parted by the fan tendon: in each of which is a round black spot, which appears like the eye of a bird, and having a white speck in the middle. The figure is shewn at (h). The under side is seen at (i). It flies in woods.

The caterpillar feeds on grass; and the chrysalis hangs by the tail. See (f) and (g). There are three broods a year; viz. in April, June, and August.

Expansion of the wings  $1\frac{1}{2}$ —2 inches.

This handsome species is not so common as some of the other species of the same genus, although distributed all over the kingdom, having occurred at Dover as well as in the north of Scotland.

#### LOZOTÆNIA OBLIQUANA. THE BARRED HOOK TIPPED MOTH.

Plate XLI. fig. m—n.

SYNONYMS. *Pyralis Obliquana*, *Fabricius*? *Haworth* (*Tortrix* O.) *Stephens* (*Lozotænia* O.) *Hubner* (*Cacoecia* O.)

*Upper Side.* The antennæ are like fine threads. The thorax and superior wings are lightish olive brown: the latter having three large dark spots, which lie across the wing in a diagonal form. The abdomen and inferior wings are paler. See the figure at (m).

The caterpillar, seen at (l), feeds on oak, spun up in the leaves; changes to the chrysalis the end of May; the moth appears in July.

Expansion of the wings one inch and a quarter.

#### HYDROCAMPA POTAMOGATA. THE BROWN CHINA MARK MOTH.

Plate XLI. fig. o—q.

SYNONYMS. *Phalæna* (*Geom.*) *Potamogata*, *Linn. Syst. Nat.* ii. p. 873. *Donovan Brit. Ins.* vol. xi. pl. 363. fig. 1.  
*Pyralis Nymphialis*, *Hubner Pyr.* pl. 13. f. 85.  
*Hydrocampus Potamogata*, *Latreille*, *Stephens*.

*Upper Side.* The antennæ are like fine threads. The superior wings are dark brown, mottled with white spots. The inferior wings are very light brown, marbled or watered with spots, and double serpentine lines.

The caterpillar, seen at (o), feeds on elder, spins up in a leaf; changes to chrysalis the end of May; and the moth appears the end of June. The chrysalis is described at (p).

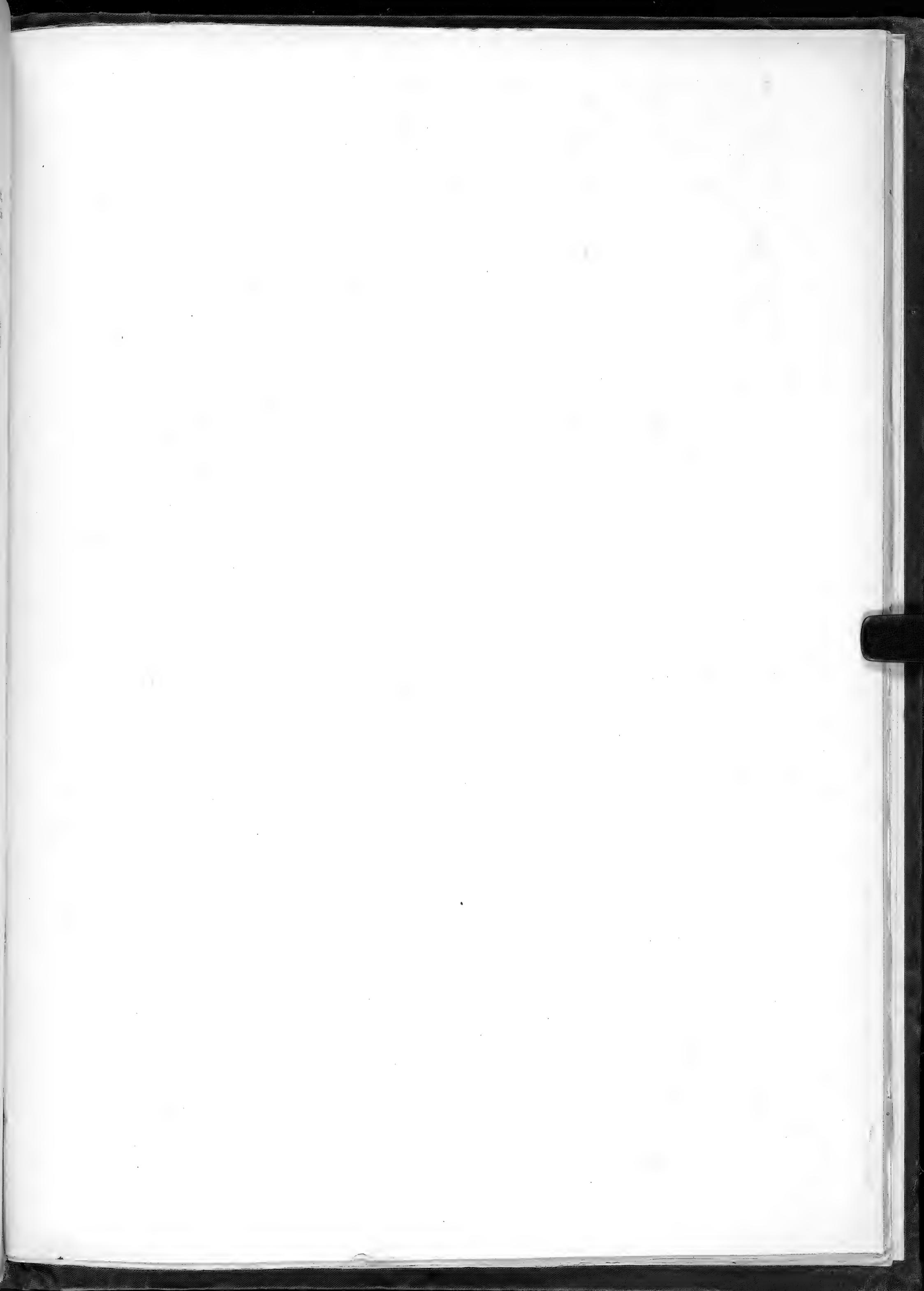
Expansion of the wings one inch.

#### HIPPARCHUS BAJULARIUS. THE MAID OF HONOUR MOTH.

Plate XLI. fig. r.

SYNONYMS. *Geometra Bajularia*, *Wien. Verz.*, *Hubner*.  
*Phalæna Ditaria*, *Fabricius*. *Donovan Brit. Ins.* vol. vi. pl. 202. fig. 1.  
*Cleora Bajularia*, *Stephens*.  
*Hipparchus Bajularius*, *Curtis*.

*Upper Side.* The antennæ are like threads. This moth is wholly of a fine green; except





a red spot, edged with white, at the lower corner of each of the superior wings, and three spots of the same kind round the fan edge of each of the inferior wings. See the figure at (r). They are taken by beating hedges of white-thorn, the end of May.

The caterpillar, from which this moth proceeds, is a green looper.

Expansion of the wings one inch.

#### ODONESTIS POTATORIA. THE DRINKER MOTH.

Plate XLII. fig. *a, m, n, p, and t.*

SYNONYMS. *Phalaena (Bombyx) Potatoria, Linn. Syst. Nat. ii. p. 813. Donov. Brit. Ins. 5. 148.*

*Albin's Ins. pl. 17. Wilkes' Eng. Moths, pl. 58.*

*Odonestis Potatoria, Germar. Samouelle Compend. pl. 12. fig. 3. Stephens, Curtis.*

*Duncan Brit. Moths, pl. 18. fig. 1. 2.*

*Upper Side.* The female is entirely of a yellowish or pale orange colour. The antennæ are finely pectinated; the palpi somewhat long. From the apex of the superior wing arises a brown mark, which crosses the wing diagonally to the lower edge, and ends near the thorax. In the middle of the wing is a white spot. This moth, in its sitting position, does not fold up its inferior wings.

The eggs, seen at (p), are deposited by the female on a large coarse kind of grass which commonly grows under hedges, to the stalks and leaves thereof the eggs adhere, being fixed by a kind of gum not dissolvable by water; they are about the bigness of a hemp seed, of a whitish colour, having a spot on the middle of the upper side, which is encircled with a black ring; they are hatched about the beginning of July, and the young caterpillars remain in that state during the winter; in spring they come forth from their secret places, and feed till the latter end of May, when they become full fed and appear of the size and form as at (n): they then spin themselves up in long silken cases, or bags, of a buff colour, wherein they change to brown chrysalides, which are round or blunt at each end, and the moth appears at the expiration of one month. The male, seen at (m), differs from the female, seen at (a), both in size and colour, being of a dark red brown colour, having the antennæ very long and broad. They fly in the evening.

Expansion of the wings  $2\frac{1}{2}$ —3 inches.

#### THECLA BETULÆ. THE BROWN HAIRSTREAK BUTTERFLY.

Plate XLII. fig. *b, c, f, g.*

SYNONYMS. *Papilio (Pleb. Rur.) Betulæ, Linn. Syst. Nat. ii. 787. Lewin's Papil. pl. 42. Donov. Brit. Ins. 8. pl. 250. ♂.*

*Thecla Betulæ, Fabricius, Leach, Curtis, Stephens. Duncan Brit. Butt. pl. 27. f. 1. 2.*

*Papilio Minor Fuscus, &c., The Brown Hair Streak, Petiv. Papil. pl. 4. f. 23. 25. ♂.*

*Papilio Minor Fuscus, &c., The Golden Hair Streak, Petiv. Papil. pl. 4. fig. 24. ♀.*

*The Hair Streak Butterfly, Albin's Ins. pl. 5. fig. 7.*

*The Brown Hair Streak. Wilkes' Eng. Moths & Butt. pl. 117.*

*Upper Side.* The antennæ are dark brown, tipped with orange. The female, seen at (e), is on the upper side totally of a dark brown, having an orange-coloured spot in that part of the wing named the fan membranes, about the size of a small horse-bean. The inferior wings have each little points or tails, one of which forms the abdominal corner: these are of an orange colour.

The *under side*, seen at (l), is of a fine orange colour. The superior wings have a spot in the middle, and a neat line of white which crosses the fan tendons parallel with the fan edge. The inferior wings have two of these lines, of which that nearest the thorax is shortest. The

legs and abdomen are on this side white. The male, at (*l*), is less, and on the upper side entirely brown; in other respects exactly like the former.

Buck-thorn is the food of the caterpillar which produces this pretty fly: the caterpillar, which is figured at (*f*), is green, and of the same form as that of the Purple Hair Streak, but much larger; it is full fed about the beginning of July, when it fixes itself to a twig by the tail, and having a kind of brace round the middle changes to the chrysalis, as seen at (*g*); and the butterfly appears the beginning of August. They fly in lanes, delighting to play about and settle on the tops of hedges.

Expansion of the wings  $1\frac{1}{3}$ — $1\frac{2}{3}$  inches.

This species is by no means common, and seems to occur only in the southern parts of the country.

#### PAMPHILA SYLVANUS. THE LARGE SKIPPER BUTTERFLY.

Plate XLII. fig. *h*.

SYNONYMS. *Hesperia Sylvanus*, *Fabricius*, *Leach*.

*Papilio Sylvanus*, *Lewin's Papil.* pl. 46. fig. 1—3. *Donov. Brit. Ins.* 8. pl. 254. f. 2. ♂.

*Haworth*.

*Pamphila Sylvanus*, *Stephens*. *Duncan Brit. Moths, &c.* pl. 2. fig. 1.

The Cloudy Hog ♀, and the Streaked Cloudy Hog ♂, *Petiver*.

*Upper Side.* The ends of the antennæ are a little hooked. The female, at (*h*), is on this side entirely of a yellow brown; having a number of squarish light orange-coloured spots. The inferior wings have a less number of these spots than the superior wings. The male is less, and much darker, and a black streak appears on each superior wing.

The caterpillar of this fly has never yet been discovered in this country. The moths delight to fly in woods, and lanes near woods; their actions are somewhat remarkable, and not unworthy notice; for whenever they settle, which is very frequent, as they are never long on the wing, they are sure to turn half-way round, so that if they settle with their heads from us they turn till their heads are toward us, and sometimes till they have turned quite round. When on the wing they have a kind of skipping motion, which is effected by reason of their closing their wings so often in their passage, and whenever they settle they also always close their wings. They are found in the months of May and August, as there are two broods a year. The male is much less.

Expansion of the wings  $1\frac{1}{6}$ — $1\frac{1}{2}$  inches.

This is one of the commonest species of the family of the Skippers, occurring plentifully throughout the country, and chiefly found on the borders of woods and on commons.

#### PAMPHILA LINEA. THE SMALL SKIPPER BUTTERFLY.

Plate XLII. fig. *i*.

SYNONYMS. *Hesperia Linea*, *Fabricius*, *Leach*.

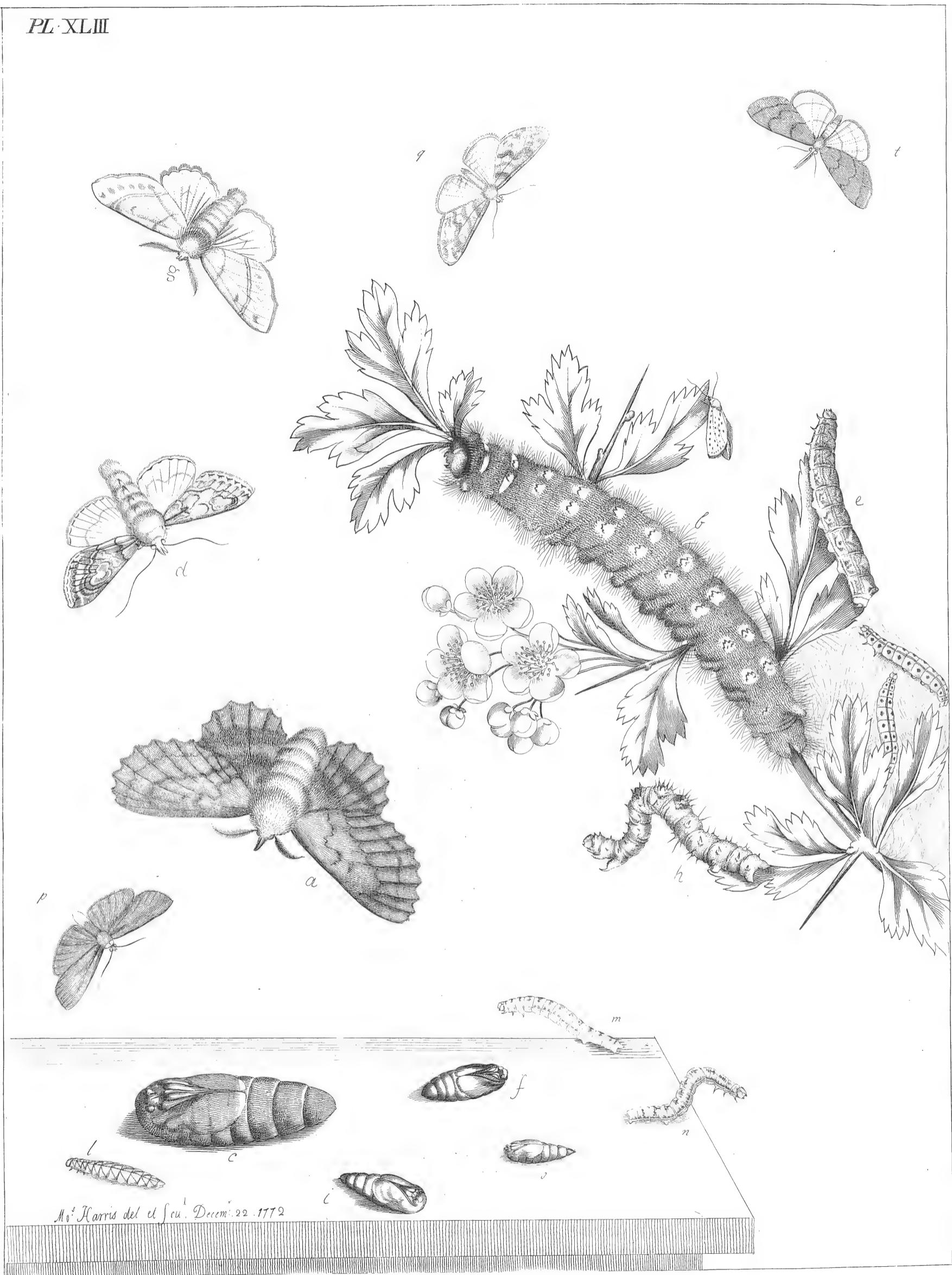
*Papilio Linea*, *Donov. Brit. Ins.* 7. pl. 236. fig. 2. ♂.

*Papilio Thaumas*, *Esper. Papil.* pl. 36. fig. 2. 3. *Lewin's Papil.* pl. 45. fig. 5—7.

*Pamphila Linea*, *Stephens*. *Duncan Brit. Moths, &c.* pl. 1. fig. 4.



PL. XLIII



*Upper Side.* This fly, figured at (i), is of a fine golden yellow colour, having a black streak in the middle of each superior wing, which is wanting in the male.

The caterpillar of this fly is also undiscovered. The moth flies in woods, and its actions are also similar to the above; but there is only one brood a year, and they appear about the middle of July.

Expansion of the wings 1— $1\frac{1}{4}$  inches.

The caterpillar of this butterfly is described by Hubner as of a deep green colour with a dark line along the back, and two whitish lines on the sides margined with black. It feeds on the mountain hair-grass and other grasses. The butterfly is common in various parts of the country.

#### DIPHTHERA RUNICA. THE SCARCE MARVEL DE JOUR MOTH.

Plate XLII. fig. e.

SYNONYMS. *Phalæna (Noct.) Runica, Gmelin, Haworth.*

*Noctua Aprilina, Fabricius. Donov. Brit. Ins. x. pl. 347. fig. 1.*

*Diphtera Runica, Hubner, Ochsenheimer, Treitschke, Curtis, Stephens.*

*Upper Side.* The antennæ are like threads. The head, thorax, and superior wings are of a lightish blue green, spotted with irregular black spots, which appear something like Hebrew characters. The abdomen and inferior wings are of a light brown; but on the abdominal corners of the latter are a few black spots.

The caterpillar of this pretty moth feeds on the oak, and is of a green colour, striped on the side. It changes to chrysalis in the earth, and the moth, which is shewn in the plate at (e), appears in May.

Expansion of the wings one inch and three-quarters.

#### NUMERIA PULVERARIA. THE FRECKLED BROAD BAR MOTH.

Plate XLII. fig. o.

SYNONYMS. *Phalæna (Geometra) Pulveraria, Linn. Syst. Nat. ii. p. 862. Albin's Ins. pl. 96. fig. d—f.*

*Numeria Pulveraria, Duponchel, Stephens.*

*Upper Side.* The antennæ are like threads. It is totally of a lightish orange brown, having a broad bar of dark reddish brown, which crosses each of the superior wings.

The caterpillar is of the looper kind. It lies during the winter in the chrysalis state, and the moth is produced in May. It is delineated in the Plate at (o).

Expansion of the wings one inch and three-quarters.

#### GASTROPACHA QUERCIFOLIA. THE LAPPET MOTH.

Plate XLIII. fig. a—c.

SYNONYMS *Phalæna (Bombyx) Quercifolia, Linn. Syst. Nat. ii. 812. Donov. Brit. Ins. vii. pl. 332.*

*Albin's Ins. pl. 16. Wilkes' Eng. Moths, pl. 57.*

*Gastropacha Quercifolia, Ochsenheimer, Stephens. Curtis Brit. Ent. pl. 24. Duncan Eng. Moths, pl. 18. fig. 3. 4.*

*Upper Side.* The antennæ are pectinated. This moth is totally of a dark red brown colour ; but toward the fan edges, which are indented, the wing is ornamented with a dark purplish gloss : two faintish serpentine bars cross each wing. In its sitting position it puts the edges of the superior wings together over its back, in such an uncommon manner that they appear like the comb of a cock, while the under wings remain expanded.

The caterpillar, at (b), feeds on black and white-thorn, and continues in that state during winter ; it is full fed about the latter end of May, when it makes a large spinning, wherein it changes to the chrysalis, seen at (c), and the moth appears in July.

Expansion of the wings  $2\frac{1}{4}$ — $3\frac{1}{4}$  inches.

The English name of this insect is given to it in allusion to the curious appendages at the sides of the body of this caterpillar, and its specific name in reference to the great resemblance of the moth, when sitting, to a withered oak leaf ; the protracted palpi serving to imitate the stalk of the leaf. The moth is far from common, but it occasionally occurs in certain localities in great profusion, as for instance, in the fens of Cambridgeshire and Huntingdonshire, where I have seen considerable numbers.

#### MISELIA OXYACANTHÆ. THE EALING'S GLORY MOTH.

Plate XLIII. fig. *d*—*f*.

SYNONYMS. *Phalæna (Noctua) Oxyacanthæ, Linn. Syst. Nat. ii. 852. Donovan Brit. Ins. v. pl. 165.*

*Wilkes' Brit. Moths, pl. 27. Albin's Insects, pl. 14. fig. 19. a—d.*

*Miselia Oxyacanthæ, Ochsenheimer, Treitschke, Curtis, Stephens.*

*Upper Side.* The antennæ are like threads. The superior wings are brown, prettily marbled with a darker colour, enlivened with veins or waved lines of a lightish green. The thorax and abdomen are crested, of a lightish brown ; as are the inferior wings.

The caterpillar is taken by beating the white-thorn about the middle of May. It changes to the chrysalis state about the end of the same month, and the moth appears in September. The caterpillar is shewn at (e), which is remarkable for a protuberance on the rump. The chrysalis, seen at (f), is of a darkish brown colour. The moth seen at (d) is seldom taken in that state.

Expansion of the wings nearly two inches.

#### HIMERA PENNARIA. THE NOVEMBER MOTH.

Plate XLIII. fig. *g*—*i*.

SYNONYMS. *Phalæna (Geometra) Pennaria, Linn. Syst. Nat. ii. 861. Donovan Brit. Ins. 8. pl. 287.*

*fig. 2. Wilkes' Brit. Moths & Butt. pl. 79. (The October Moth.)*

*Himera Pennaria, Duponchel, Stephens.*

*Upper Side.* The antennæ are pectinated. The head, thorax, abdomen, and wings are of a lightish yellow orange : the superior wings having a very broad bar of a deeper colour, crossing each.

The caterpillars are very plentiful on the oaks in Norwood, and are got by beating the trees : they appear about the colour of the bark of the twigs, and are full of sharp-pointed protuberances, as at (h). When full fed, which is about the end of September, they spin up in the leaves, and

change into chrysalis, which is represented at (i), and the moth appears in November; the male is shewn in the Plate at (g).

Expansion of the wings two inches.

#### POLYPOGON BARBALIS. THE SNOUT, OR FAN-FOOTED MOTH.

Plate XLIII. fig. l. t.

SYNONYMS. *Phalæna* (Geom.) *Barbalis*, *Linn. Syst. Nat.* ii. 881. *Haworth. Albin's Ins.* 74. f. e—h.

*Pyralis Barbalis*, *Curtis.*

*Polypogon Barbalis*, *Schrink, Stephens (Cat.)*

*Pechipogon Barbalis*, *Hubner, Stephens (Illus.)*

*Upper Side.* The antennæ are like threads. The superior wings are of a dark brown, having three dark lines crossing each. The abdomen and inferior wings are of a lighter brown, the latter having two lines crossing each. The palpi of this moth are near a quarter of an inch in length.

The caterpillar, which is figured at (l), is of a pleasant brown or tan colour, and is found by beating oaks in October, when they spin up in the leaves and change into chrysalis; and the moth, which is figured at (t), appears the beginning of June following.

Expansion of the wings one inch and a half.

#### GNOPHRIA RUBRICOLLIS. THE RED NECK, OR BLACK FOOTMAN MOTH.

Plate XLIII. fig. p.

SYNONYMS. *Phalæna* (Noct.) *Rubricollis*, *Linn. Syst. Nat.* ii. 840. *Donov. Brit. Ins.* x. pl. 350. fig. 3.

*Lothosia Rubricollis*, *Fabricius, Haworth.*

*Gnophria Rubricollis*, *Stephens.*

*Upper Side.* The antennæ are like threads. This moth is totally of a sooty black, except the neck or collar, which is red, and the three last joints of the abdomen, which are of a fine golden yellow colour. This moth is commonly seen flying about the tops of high oaks the beginning of June: but the caterpillar has not yet been discovered.

Expansion of the wings one inch and a quarter.

#### ANISOPTERYX LEUCOPHEARIA. THE SPRING USHER MOTH.

Plate XLIII. fig. m, n, o, q.

SYNONYMS. *Geometra Leucophearia*, *Wien. Verz., Hubner.*

*Anisopteryx Leucophearia*, *Stephens.*

*Hybernia Leucophearia*, *Curtis.*

*Upper Side.* The antennæ are like threads. The head, thorax, and superior wings are brown, having darker waved cloud-like bars crossing them. The inferior wings are light brown, having some waved marks near the abdominal edges.

The caterpillars feed on oak, and are taken by beating about the middle of May. They are of two sorts, one green, spotted with black; the other green, spotted with red. They change to their chrysalis state in the earth about the twentieth of May, and the moths appear toward the

end of February. The caterpillars are very plentiful in their season, and are of the looper kind, as seen at (m) and (n) in the Plate. The chrysalis is small and brown at (o), and the moth of a lightish brown, mottled with a darker colour, as at (q).

Expansion of the wings one inch and a half.

#### YPONOMEUTA EVONYMELLA. THE FULL-SPOTTED ERMINE MOTH.

Plate XLIII. fig.

SYNONYMS. *Phalæna (Tinea) Evonymella*, *Linn. Syst. Nat. ii. 885. Donovan Brit. Ins. vol. ii. pl. 355. fig. 4.*

*Yponomeuta Evonymella*, *Latreille, Leach, Curtis, Stephens.*

*Erminea Evonymi*, the Full-spotted Ermine, *Haworth.*

The Distaff Ermine, *Harris' Vade Mecum*, p. 25.

The little white moth with black spots, and the caterpillars within a web.

Expansion of the wings from two-thirds to one inch.

This insect is extremely destructive to the foliage of various fruit trees, the sloe, white thorn, and black-thorn hedges, &c. The caterpillars, which reside in a web in society, in considerable numbers, devour the leaves and often completely defoliate the trees, in the same manner as the *Yponomeuta Padella*, figured in plate 3.

#### DEILEPHILA EUPHORBIÆ. THE SPOTTED ELEPHANT HAWK-MOTH.

Plate XLIV. fig. *a* and *c*.

SYNONYMS. *Sphinx Euphorbiæ*, *Linn. Syst. Nat. ii. 802. Donovan Brit. Ins. pl. 91. 92.*

*Deilephila Euphorbiæ*, *Ochsenheimer. Curtis Brit. Entomol. pl. 3. Stephens. Duncan Brit. Moths*, pl. 8.

*Upper Side.* The antennæ are more than half an inch in length, and of a pale flesh colour. The thorax and abdomen are of a brown olive colour: the latter having two square black spots on each side. The superior wings are of an olive colour toward the sector edges; but the other parts incline to a pink or rose colour: toward the shoulder is an olive-coloured cloud of irregular form: about the middle of the wing on the bar is another, about the same size and colour; a third spot, which is a kind of bar or stripe, arises at the slip edge more than a quarter of an inch in breadth, and crossing the fan tendons ends in a point at the apex of the wing. The inferior wings are of a rose colour, having a bar or stripe of black crossing each.

It has been long in dispute, whether the Spotted Elephant was a native of this island; but it is now past a doubt, as I had the good fortune to find a caterpillar of this moth in marshy ground at Barnsley, near Crayford, in Kent, about the middle of August. It was more than three inches long, of a dark brown colour: the horn at the tail part, which was about half an inch long, appeared black and glossy. The head was nearly the size of a small pea, and of a lightish yellow brown or tan colour. I tried various herbs to bring it to feed, but my attempts were fruitless, and it died from want. The chrysalis in the Plate at (c) was sent me from Belisle in France; and the moth at (a) was produced from it about the beginning of June.

Expansion of the wings three inches.

Harris here confounded together two distinct but closely allied species of Hawk Moths; the Moth described above as having been reared from a French chrysalis, not





being produced from a larva similar to that captured by Harris near Crayford. The moth however is now ascertained to be unquestionably British. The caterpillar is that of *Deilephila Galii*, Ochsenheimer, Stephens' Illust. Haust. i. pl. 12. f. 2. (*Sphinx Galii*, Hubner, Sphinx, pl. 12. fig. 64. Haworth in Trans. Ent. Soc. 1807, pl. 4.)

The *Deilephila Euphorbiæ* feeds upon several species of *Euphorbia*, *E. Cyparissias* being its favourite plant, although it will also feed on *E. Esula* and *E. Paralias*; it however rejects several other species of the same genus. Mr Raddon, the celebrated engraver, detected this species in considerable numbers on the last named plant, growing in great abundance on the extensive sand-hills at Appledore and Braunton Barrows, near Barnstable in Devonshire. "They are full grown about the middle of September, when they descend into the sand and change to chrysalides, forming a loose case of earth around them, from which they emerge the beginning of the following June. Sometimes however they remain in the pupa state two seasons, as many other Lepidoptera do; a wise provision of nature to prevent any accident from destroying the whole brood. The sand-hills, where the larva is found, are of great extent and magnitude, and must have been collected by the winds and storms to which they are constantly exposed: during the winter the whole soil is frequently moved so as completely to alter the surface of the country; a great number of the pupæ must consequently be destroyed or buried at a great depth below the surface, where probably they lie hid until they are brought to life and light by the influence of the elements." Curtis, Brit. Ent. pl. 3.; and see, for further details concerning this insect, the Entomological Magazine, No. 9, in illustration of two beautiful plates figuring the entire history of the insect, by Mr. Raddon himself. In the following number of the same work Mr. Raddon has supplied some additional particulars relative to the same insect, shewing its occasional rarity or abundance. Thus in 1814 he would not capture any of the caterpillars which were not full-fed; and after one day's pursuit, having forgotten to take any food for his caterpillars, and it being nearly dusk, he cut an arm-full of the spurge, and at night put it in water; the next morning, on going to feed his larvæ, he found the food covered with, he thinks, not less than a hundred minute larvæ, not above a day or two old. Since that period the surface of the valley in which the insects were found, has been completely altered by the action of the winds, and the insect has become almost extirpated.

*Deilephila Galii* is a much rarer insect than the former, but numerous instances of its capture are recorded by Stephens, and also in the Entomological Magazine, No. 9, p. 434, 435; No. 13, p. 285; No. 14, p. 409, 410, 415; and No. 16, p. 83.

#### HIPPARCHIA SEMELE. THE GRAYLING [OR ROCK UNDERWING] BUTTERFLY.

Plate XLIV. fig. *d—e*.

SYNONYMS. *Papilio* (Nymph. Gemm.) *Semele*, *Linn. Syst. Nat.* ii. p. 777. *Lewin's Papil.* pl. 17.

*Donov. Brit. Ins.* vol. viii. pl. 259. ♀.

*Hipparchia Semele*, *Ochsenheimer*, *Stephens*, *Curtis*. *Duncan Brit. Butt.* pl. 22. fig. 1. 2.

The Rock Underwing Butterfly, *Wilkes' Designs*, pl. 5. fig. 4.

*Papilio Oculis*, &c. The Tunbridge Grayling, *Petiv. Pap.* v. fig. 3. ♀. *Ibid. pl. v.* fig.

4. ♂. (The Brown Tunbridge Grayling.)

*Upper Side.* This fly is totally of a dark brown colour, having in each superior wing two ocelli, about the circumference of a small tare, one on the first and another on the fourth fan membrane. The inferior wings have a large triangular spot on each fan membrane, which are five in number; these are of an orange colour. In that on the first membrane is a small eye-like spot, which, like those in the superior wing, has a small white speck in the middle.

The caterpillar is very rarely found, but is well known to feed on grass. It is about an inch and a half long, and of a fine green colour. The moths always fly very smartly in woods where there is plenty of shrubs and long grass; and consequently are not easily taken. It is named by Wilks the Rock Underwing: why he should think it necessary to alter it from its original name is unknown to me. They were first taken by the Aurelians at Tunbridge, and were called for some time the Tunbridge Grayling. The upper side of the female is seen at (d), and the under side at (e), as sitting on the blossom of clover.

Expansion of the wings  $2\frac{1}{4}$ — $2\frac{1}{2}$  inches.

This is an abundant and widely distributed species, frequenting rocky and woody places. According to Mr. Wailes, it is almost confined to the Magnesian limestone district near South Shields. The caterpillar and chrysalis are light green, the former with dark legs.

HIPPARCHIA TITHONUS. THE GATE KEEPER [OR LARGE HEATH]  
BUTTERFLY.

Plate XLIV. fig. *f*—*g*.

SYNONYMS. *Papilio* (Nymph. Gemm.) *Tithonus*, *Linn. Mantissa*, i. 537. *Lewin's Pap.* pl. 22.  
*Hipparchia Tithonus*, *Ochsenheimer*, *Curtis*, *Stephens. Duncan Brit. Butt.* pl. 23. f. 2. 3.  
*Papilio Pilosellæ*, *Fabr. Ent. Syst.* 3. 240. *Haworth. Donov. Brit. Ins.* vol. xii.  
pl. 405.  
*Papilio Tithonus*, *Villars*, 2. 26. 37.  
*Papilio Herse*, *Hubner*.  
*Papilio Phædra*, *Esper*.  
*Papilio Aureo-fuscus*, &c. The Hedge Eye, with Double Specks. *Petiv. Pap.* pl. v. fig.  
11. ♂. fig. 12. ♀.

*Uppe Side.* The antennæ, head, thorax, and abdomen are of a dark brown. The superior wings are of a fine yellow orange colour, bordered on the sector and fan edges with dark brown; on the third and fourth fan membrane is a round black spot, which extends the width of these two membranes, having two small white specks in the middle. The inferior wings are of a dark brown, having a large orange-coloured spot in the middle. A small eye-like spot is visible in some near the abdominal corner. The haunts of this fly are on the sides of hedges, in lanes and meadows. Their first appearance is about the middle of July, though indeed the females do not appear till the beginning of August; which being taken for a distinct species, went some time by the name of the Orange Field. Neither the caterpillar nor chrysalis has hitherto been discovered. The female is seen in the Plate at (*f*), shewing the upper side; the male at (*g*), displaying the under side, and discovering a great part of the upper side of one of the superior wings.

Expansion of the wings  $1\frac{1}{2}$  to nearly 2 inches.

This species is also very abundant, and widely distributed, frequenting grassy lanes and fields, and especially preferring the blossoms of the bramble. The cater-

pillar is greenish streaked with white, with a brown head, and feeds on the annual meadow grass, and also, according to some authors, upon *Hieracium Pilosellæ*. The chrysalis is green.

CABERA PUSARIA. THE PALE WAVED MOTH.

Plate XLIV. fig. *h*.

SYNONYMS. *Phalæna (Geometra) Pusaria*, *Linn. Syst. Nat.* ii. 864. *Stewart. Albin's Ins.* pl. 118. fig. *e—h*.

*Cabera Pusaria, Treitschke, Stephens.*

*Aspilates Pusaria, Curtis.*

*Upper Side.* The antennæ are pectinated, and more than a quarter of an inch in length. This moth is entirely of a yellowish white, having three palish lines crossing each wing. It is taken by beating the hedges in May.

The caterpillar is of the looper kind, and feeds on white-thorn; it changes to chrysalis in a spinning about September, and the moth comes forth about the middle of May. A figure of the upper side of the moth is seen in the Plate at (*h*).

Expansion of the wings one inch and a quarter.

T H E E N D.

O God, thou hast taught me from my youth; and hitherto have I declared thy wondrous works!

PSALM lxxi. 17.



## SYSTEMATIC LIST

OF THE

### SPECIES OF INSECTS FIGURED IN THE AURELIAN.

#### ORDER—LEPIDOPTERA.

##### Section—RHOPALOCERA.

(*Papilio, Linn.*)

##### Family—PAPILIONIDÆ.

- Papilio Machaon*, pl. xxxvi.  
*Pontia Cardamines*, pl. xxxii. fig. *f*—*i*.  
*Leucophasia Sinapis*, pl. xxix. fig. *t*—*u*.  
*Colias Electra*, pl. xxix. fig. *m*—*o*.  
*Pieris Crataegi*, pl. ix.

##### Family—NYMPHALIDÆ.

- Melitæa Cinxia*, pl. xvi. fig. *a*—*f*.  
— *Artemis*, pl. xxviii. fig. *e*—*i*.  
— *Selene*, pl. xxxi. fig. *i*—*k*.  
— *Athalia*, pl. xxxviii. fig. *f*—*g*.  
— *Euphrosyne*, pl. xl. fig. *e*—*f*.  
*Argynnus Aglaia*, pl. xxvi. fig. *o*—*p*.  
— *Adippe*, pl. xxviii. fig. *a*—*d*.  
— *Paphia*, pl. xxxiv. fig. *k*—*n*.  
*Vanessa C. Album*, pl. i.  
— *Urticæ*, pl. ii.  
— *Atalanta*, pl. vi.  
— *Io*, pl. viii.  
— *Antiopa*, pl. xii.  
*Apatura Iris*, pl. iii.  
*Cynthia Cardui*, pl. xi.  
*Limenitis Camilla*, pl. xxx. fig. *m*—*n*.  
*Hipparchia Galathea*, pl. xi.  
— *Pamphilus*, pl. xxi. fig. *e*—*h*.  
— *Megæra*, pl. xxvii. fig. *a*—*g*.  
— *Janira*, pl. xxxii. fig. *a*—*e*.  
— *Hyperanthus*, pl. xxxv. fig. *h*.  
— *Ægeria*, pl. xli. fig. *f*—*k*.  
— *Semele*, pl. xliv. fig. *d*—*e*.  
— *Tithonus*, pl. xliv. fig. *f*—*g*.

##### Family—ERYCINIDÆ.

- Nemeobius Lucina*, pl. xxvii. fig. *n*—*o*.

##### Family—LYCÆNIDÆ.

- Lycæna Phœas*, pl. xxxiv. fig. *p*.  
*Polyommatus Alexis*, pl. xxxix. fig. *g*—*i*.  
*Thecla Quercus*, pl. x.  
— *Rubi*, pl. xxvi. fig. *a, b, d, g*.  
— *Betulæ*, pl. xlii. fig. *b, c, f, g*.

#### Family—HESPERIIDÆ.

- Thymele Alveolus*, pl. xxxii. fig. *f, l, n*.  
— *Tages*, pl. xxxiv. fig. *o*.  
*Pamphila Sylvanus*, pl. xlii. fig. *h*.

#### Section—HETEROCERA.

(*Sphinx and Phalæna, Linn.*)

##### Family—SPHINGIDÆ.

- Acherontia Atropos*, pl. xxxvii.  
*Sphinx Ligustri*, pl. ii.  
— *Convolvuli*, pl. xxi. fig. *a*—*d*.  
*Deilephila Elpenor*, pl. vii.  
— *Euphorbiæ*, pl. xliv. fig. *a*—*c*.  
— *Galii Larva*, pl. xliv. fig. *l*.  
*Smerinthus Ocellatus*, pl. v.  
— *Tiliæ*, pl. xx. fig. *a*—*g*.  
— *Populi*, pl. xxxiii. fig. *a*—*g*.

##### Family—SESIIDÆ.

- Macroglossa Stellatarum*, pl. xxiv. fig. *f*—*l*.

#### Family—ANTHROCERIDÆ, *Westw.*

(*Zygænidæ, Steph.*)

- Anthrocera Filipendulæ*, pl. i.  
*Ino Statices*, pl. xxxiv. fig. *a*—*f*.

#### Family—HEPIALIDÆ.

- Hepialus Sylvinus*, pl. xxii. fig. *h*—*m*.  
*Cossus Ligniperda*, pl. xxiii.

#### Family—BOMBYCIDÆ.

- Saturnia Pavonia minor*, pl. xxv. fig. *a*—*i*.  
*Bombyx Mori*, pl. xiii. fig. *a*—*f*.  
*Gastropacha Quercifolia*, pl. xlvi. fig. *a*—*c*.  
*Odonestis Potatoria*, pl. xlvi. fig. *a, m, n, p, t*.  
*Lasiocampa Quercus*, pl. xxix. fig. *a*—*f*.  
*Eriogaster Lanestris*, pl. xxv. fig. *k*—*o*.  
*Clisiocampa Neustria*, pl. xvii. fig. *a*—*f*.

#### Family—NOTODONTIDÆ.

- Pygæra Bucephala*, pl. xxxix. fig. *a*—*c*.  
*Cerura Vinula*, pl. xxxviii. fig. *a*—*e*.  
*Episema Cœruleocephala*, pl. xxx. fig. *a*—*d*.

#### Family—ARCTIIDÆ.

- Dasychira Pudibunda*, pl. xv.  
*Leucoma Salicis*, pl. v.

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Arctia Caja, pl. xiii. fig. *g*—*m*.  
 —— Villica, pl. iv.  
 Phragmatobia Fuliginosa, pl. xxvii. fig. *i*—*m*.  
 Nemeophila Plantaginis, pl. xvi. fig. *g*—*m*.  
 Spilosoma Lubricepeda, pl. xvii. fig. *g*—*l*.  
 Porthesia Chrysorrhæa, pl. xxv. fig. *p*—*s*.  
 Cyenia Mendica, pl. xxxv. fig. *m*.  
 Orgyia Gonostigma, pl. xiv. fig. *a*—*g*.  
 —— Antiqua, pl. xx. fig. *h*—*p*.  
 Hypercompa Dominula, pl. xl. fig. *a*—*d*.

Family—LITHOSIIDÆ.

Callimorpha Jacobææ, pl. iv.  
 —— Miniata, pl. xxx. fig. *p*.  
 Gnophria Rubricollis, pl. xlvi. fig. *p*.

Family—NOCTUIDÆ.

Catocala Fraxini, pl. xxxi. fig. *a*—*e*.  
 —— Nupta, pl. xviii. fig. *g*—*m*.  
 —— Promissa, pl. xix. fig. *g*—*l*.  
 Triphaena Pronuba, pl. xxxix. fig. *d*—*f*.  
 Plusia Chrysitis, pl. xxii. fig. *a*—*c*.  
 Nænia Typica, pl. xxii. fig. *d*—*g*.  
 Mamestra Persicariæ, pl. xxiv. fig. *a*—*e*.  
 Anarta Heliaca, pl. xxxiii. fig. *o*.  
 Gortyna Flavago, pl. xxxv. fig. *a*—*e*.  
 Ceropacha Diluta, pl. xxxv. fig. *f*—*g*.  
 Phlogophora Meticulosa, pl. xli. fig. *c*—*e*.  
 Dipthera Runica, pl. xlvi. fig. *e*.  
 Miselia Oxyacanthæ, pl. xlvi. fig. *d*—*f*.  
 Cosmia Trapetzina, pl. x.  
 Acronycta Psi, pl. xv.  
 Cucullia Verbasci, pl. viii.  
 Brepha Parthenias, pl. xxxv. fig. *i*.  
 Euclidia Glyphica, pl. xl. fig. *f*—*s*.

Family—GEOMETRIDÆ.

Amphidasis Betularius, pl. xviii. fig. *a*—*f*.  
 —— Hirtarius, pl. ix.  
 Anisopteryx Leucophearia, pl. xlvi. fig. *m*, *n*, *o*, *q*.  
 Himera Pennaria, pl. xlvi. fig. *g*—*i*.  
 Hybernia Defoliaria, pl. xiv. fig. *n*—*r*.  
 Bupalus Favillacearius, pl. xxxiii. fig. *m*.  
 Abraxas Grossulariata, pl. xii.  
 Odontopera Bidentata, pl. x.  
 Melanippe Hastata, pl. xv.  
 Anaitis Plagiata, pl. xxviii. fig. *k*.  
 Venilia Macularia, pl. xxviii. fig. *m*.  
 Rumia Cratægata, pl. xxix. fig. *g*—*l*.  
 Minoa Chærophyllata, pl. xxx. fig. *o*.  
 Larentia Chenopodiata, pl. xxxiii. fig. *n*.  
 Halia Vauaria, pl. xxxiv. fig. *g*—*i*.  
 Electra Fulvata, pl. xxxv. fig. *l*.  
 Hipparchus Bajularius, pl. xlvi. fig. *r*.  
 Numeria Pulveraria, pl. xlvi. fig. *o*.  
 Chlorissa Thymearia, pl. iii.  
 Cabera Pusaria, pl. xlvi. fig. *h*.  
 Eupithecia Centaureata, pl. xiv. fig. *a*—*f*.

Family—PLATYPTERICIDÆ.

Drepana Hamula, pl. xli. fig. *a*—*b*.

Family—TORTRICIDÆ.

Chloephora Prasinana, pl. x.  
 —— Quercana, pl. xxx. fig. *e*—*h*.  
 Tortrix Viridiana, pl. x.  
 Lozotænia Obliquana, pl. xlvi. fig. *m*—*n*.

Family—PYRALIDÆ.

Hypena Proboscidalis, pl. xxxi. fig. *f*—*h*.  
 Botys Urticata, pl. vi.  
 Pyrausta Purpuralis, pl. xxviii. fig. *l*.  
 Ennychia 8-maculata, pl. xxvii. fig. *p*.  
 Scopula Olivalis, pl. xxix. fig. *p*—*s*.  
 Hydrocampus Lemnata, pl. vii.  
 —— Potamogota, pl. xlvi. fig. *o*—*q*.  
 Margarita Verticalis, pl. xxxiii. fig. *h*—*l*.  
 Polypogon Barbalis, pl. xlvi. fig. *l*—*t*.

Family—TINEIDÆ.

Yponomeuta Padella, pl. iii.  
 —— Evonymella, pl. xlvi.

Family—ALUCITIDÆ.

Pterophorus Pentadactylus, pl. i.  
 —— Pterodactylus, pl. xxx. fig. *i*—*l*.

ORDER—COLEOPTERA.

Family—HYDROPHILIDÆ.

Hydrophilus Caraboides, pl. xxvi. fig. *e*—*i*.

Family—DERMESTIDÆ.

Dermestes Lardarius, pl. 5.

Family—CETONIIDÆ.

Cetonia Aurata, pl. xvii. fig. *m*—*q*.

Family—CURCULIONIDÆ.

Strophosoma Coryli, pl. xiv. fig. *h*—*m*.

Family—COCCINELLIDÆ.

Coccinella 7-punctata, pl. xxii. fig. *n*—*t*.

ORDER—NEUROPTERA.

Family—LIBELLULIDÆ.

Libellula Caneellata, *L.* ? pl. xxvi. fig. *n*.  
 —— Depressa, pl. xxvi. fig. *k*—*m*.

ORDER—HYMENOPTERA.

Family—ICHNEUMONIDÆ.

Ichneumon Lentorius ? pl. vii.

ORDER—DIPTERA.

Family—MUSCIDÆ.

Tachina spec. ? pl. i.

## ALPHABETICAL INDEX

TO

### HARRIS'S NATURAL HISTORY OF ENGLISH MOTHS AND BUTTERFLIES,

WITH THEIR

MODERN SYSTEMATIC NAMES.

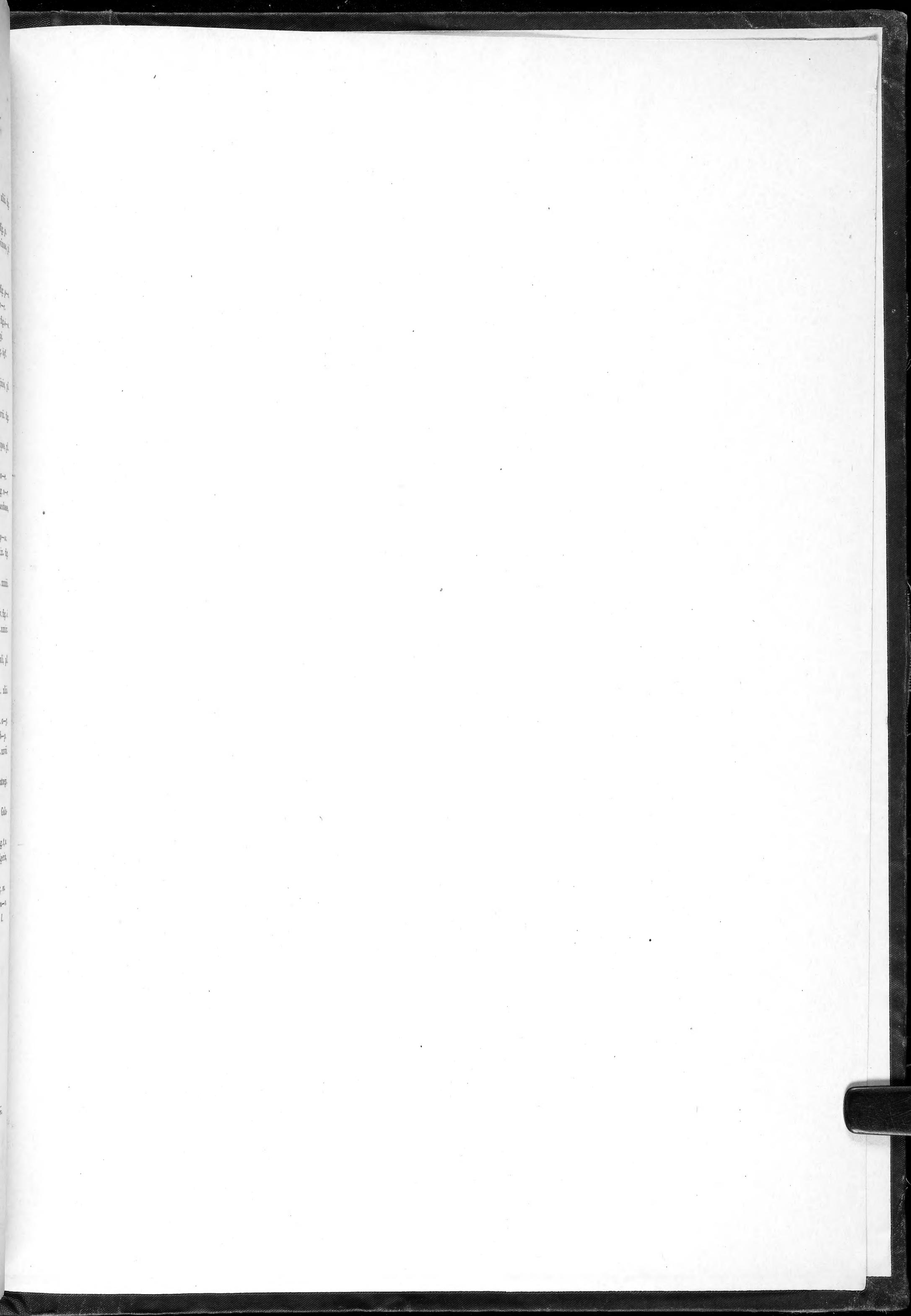
- Admirable, or red Admiral Butterfly, *Vanessa Atalanta*, pl. vi. fig. *a—h*.  
— white, or white Admiral Butterfly, *Limenitis Camilla*, pl. xxx. fig. *m, n*.  
Arches, red, Moth, *Callimorpha Miniata*, pl. xxx. fig. *p*.  
Argent and sable, or mottled Beauty Moth, *Melanippe Hastata*, pl. xv. fig. *med. dextr.*  
Bar, dun, Moth, *Cosmia Trapetzina*, pl. x. fig. *n—r*.  
— broad scolloped-wing, Moth, *Odontopera Bidentata*, pl. x. fig. *s—x*.  
— triple, Moth, *Anaitis Plagiata*, pl. xxviii. fig. *k*.  
— grey scolloped, Moth, *Mæsia Favillacea*, pl. xxxiii. fig. *m*.  
— shaded, broad, or small Mallow Moth, *Eubolia Chænopodiata*, pl. xxxiii. fig. *n*.  
— freckled, broad, Moth, *Numeria Pulveraria*, pl. xl. fig. *o*.  
Beauty, brindled, Moth, *Amphidasis Hirtarius*, pl. ix. fig. *a—f*.  
Betony, Water, Moth, *Cucullia Verbasci*, pl. viii. fig. *a—e*.  
Blue, common, Butterfly, *Polyommatus Alexis*, pl. xxxix. fig. *g—i*.  
Brass, burnished, Moth, *Plusia Chrysitis*, pl. xxii. fig. *a—c*.  
Brimstone Moth, *Rumia Cratægata*, pl. xxix. fig. *g—l*.  
Brown Meadow Butterfly, *Hipparchia Janira*, pl. xxxii. fig. *a—e*.  
Burnet, six-spotted, Moth, *Anthrocera Filipendulæ*, pl. i. fig. *e—i*.  
Camberwell Beauty Butterfly, or Grand surprise, *Vanessa Antiope*, pl. xii. fig. *a—e*.  
China mark, white, Moth, *Hydrocampus Lemnata*, pl. vii. fig. *l—p*.  
— likeness, Moth, *Scopula Olivalis*, pl. xxix. fig. *p—s*.  
— brown, Moth, *Hydrocampus Potamogata*, pl. xli. fig. *o—q*.  
Chimney-sweeper Moth, *Minoa Chærophylla*, pl. xxx. fig. *o*.  
Comma Butterfly, *Vanessa C. Album*, pl. i. fig. *a—d*.  
Copper, small, Butterfly, *Lycæna Phlæcas*, pl. xxxiv. fig. *p*.  
Crimson and gold Moth, *Pyrausta Purpuralis*, pl. xxviii. fig. *e*.  
Dagger, grey, Moth, *Acronycta Psi*, pl. xv. fig. *sup. dext.*  
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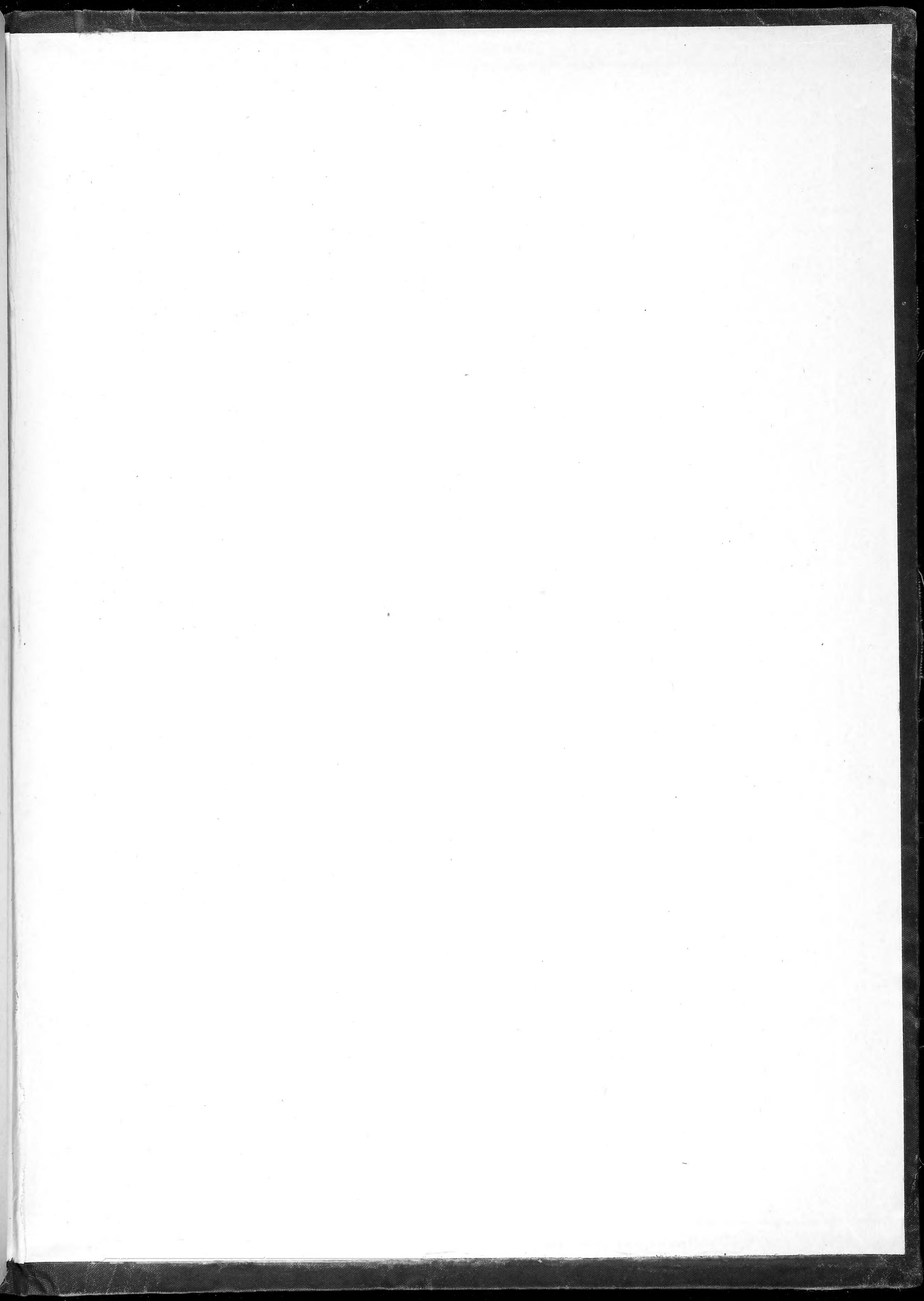
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